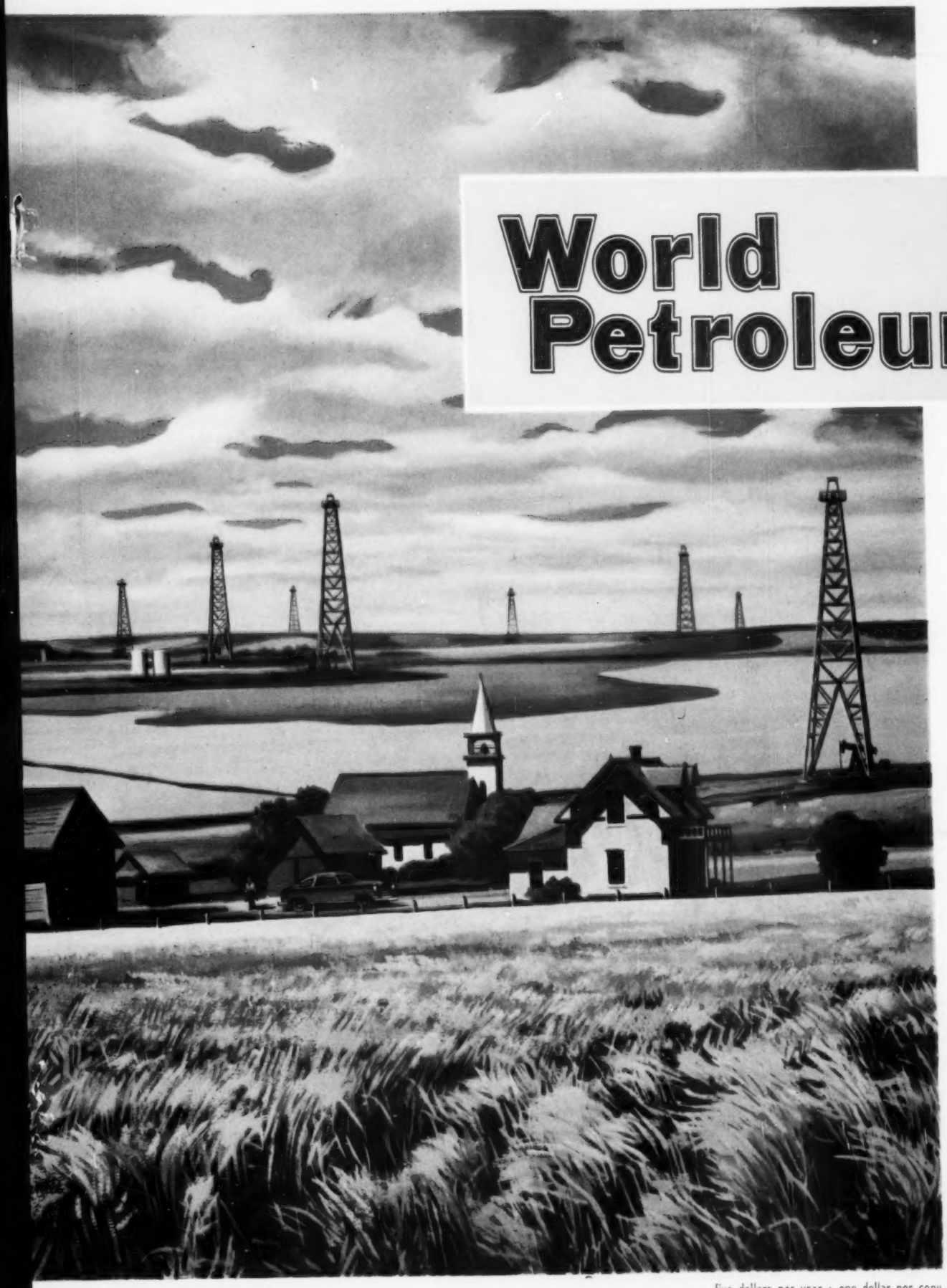
NOVEMBER, 1952



# World Petroleum

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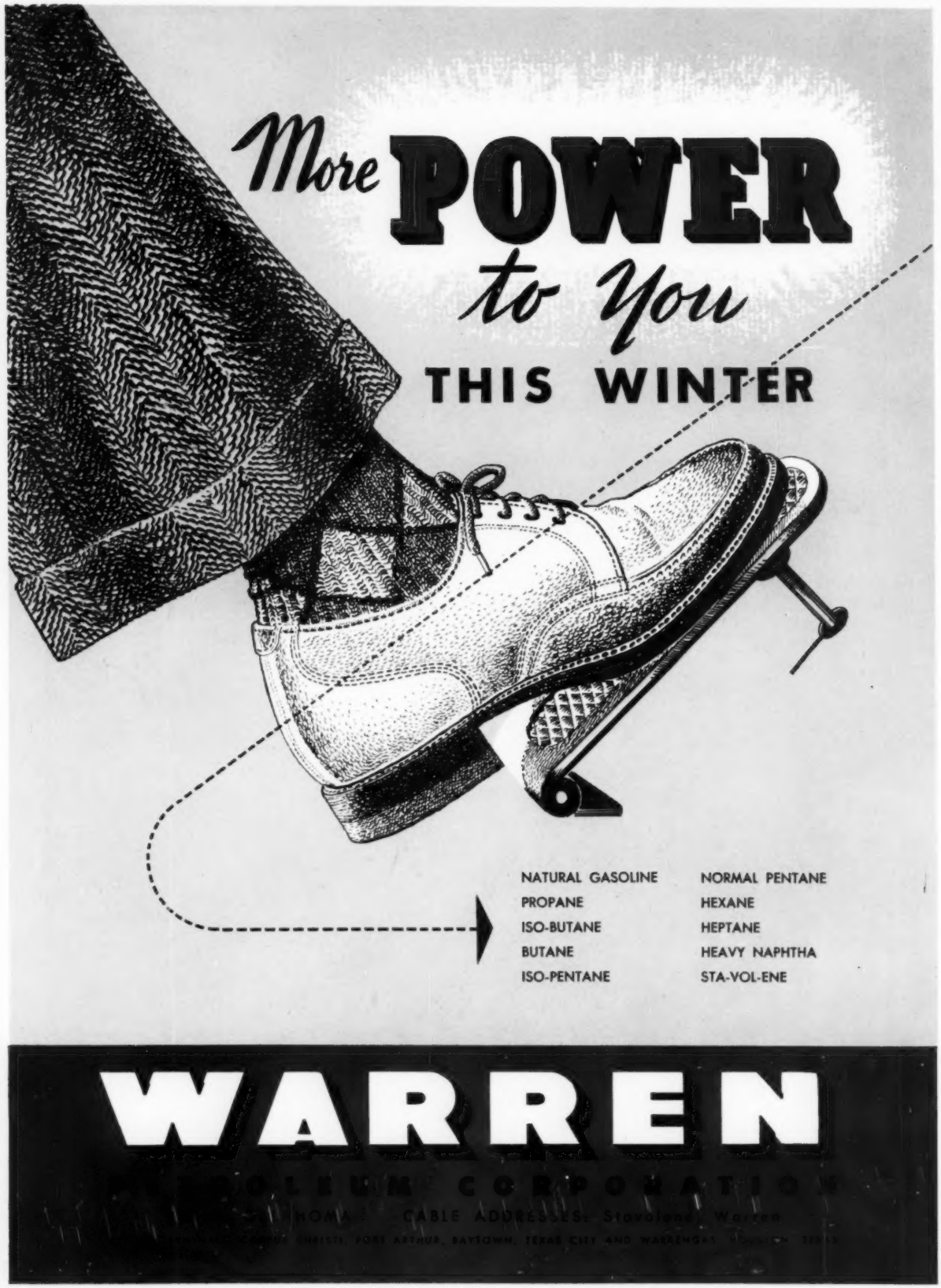


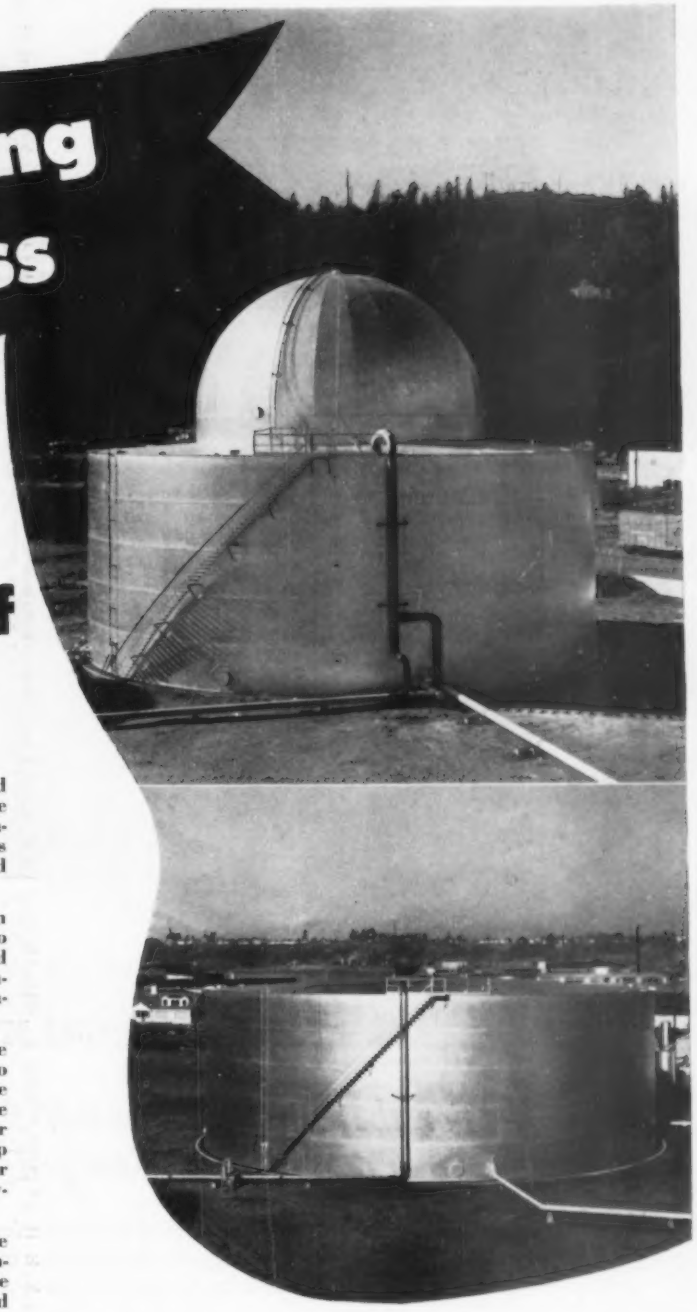

WARREN

PETROLEUM CORPORATION

TULSA, OKLAHOMA — CABLE ADDRESSES: Stavoland, Warren

REFINERIES AT CORPUS CHRISTI, PORT ARTHUR, BAYTOWN, TEXAS CITY AND WARRENDALE, HOUSTON, TEXAS

# Reducing Vapor Loss with a Hortondome Roof



The Hortondome Roof* is a special type of roof designed to prevent evaporation losses from flat-bottom oil storage tanks. Used primarily to reduce standing storage evaporation losses, it provides a variable vapor space which allows the air-vapor mixture above the liquid in the tank to expand and contract without being vented to the atmosphere.

A tank with a Hortondome Roof may be operated as an individual unit or it may be connected, by vapor lines, to the vapor spaces of one or more adjacent tanks with fixed roofs. Complete protection of all moving parts and simplicity of vents, gauges and other tank fittings insure continuous and dependable operation at all times.

Operation of a Hortondome Roof is simple. A flexible hemispherical membrane is attached, by its outer edge, to the equator of the Hortondome. As evaporation takes place or filling occurs, the membrane rises to make room for the increased vapor volume or vapor displaced by liquid. Air above the membrane is forced out through a vent at the top of the dome. When conditions causing the increased vapor volume are reversed, the vapor returns to the tanks allowing the flexible membrane to descend.

The flexible membrane in the Hortondome Roof is made of Chi-lon*, a fabric coated on both sides with petroleum-resistant synthetic rubber. The coating material and the seams are designed to withstand immersion in the liquid stored as well as the vapor from it.

Further information or quotations on the Hortondome Roof, or any other Horton structures, may be obtained by writing our nearest office.

**Trade Mark Registered U.S. Patent Office*

*Top View: 100-ft. diam. by 40-ft. tank with Hortondome Roof located in the Pacific Northwest.*

*Bottom View: The vapor space of this 120-ft. diam. by 40-ft. cone roof tank is connected to the Hortondome Roof.*

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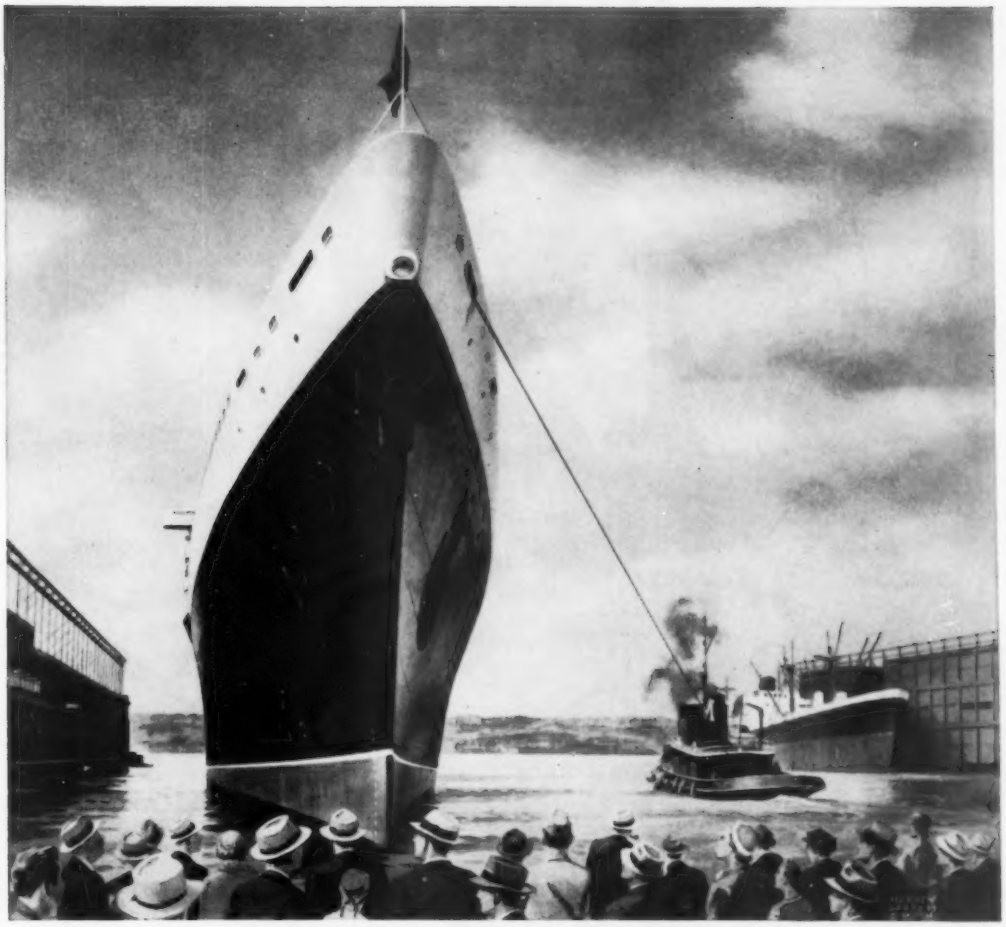

## Something you may not have noticed about the S.S. United States

You've probably read all about the amazing construction, the great size and the record-breaking speed of the liner United States.

But you may not have noticed something extremely important about her crew. Every officer or man in a post of responsibility is a man of impressive experience. Her present skipper has been a shipmaster for thirty-two years. The chief engineer has been in engine rooms for 29 years. Even her executive chef has been in charge of ships' kitchens for 25 years.

In an operation as complex as sailing a great liner . . . or serving a great industry . . . there is simply no substitute for experience. And it is interesting to note that most of the men at the helm of the company which supplies the petroleum industry with the major part of its antiknock compound requirements are men who have been with Ethyl for upwards of twenty years.

For example: The man in charge of manufacturing at Ethyl has been with us for 26 years. The head of technical services has had 23 years of Ethyl experience; and all four regional sales managers have more than twenty-two years of service.

Is it any wonder that Ethyl so thoroughly appreciates and understands the problems of refining, distributing and selling petroleum products?

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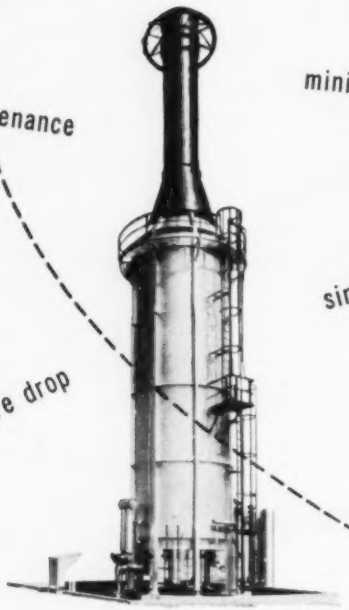
# most efficient

**PETRO - CHEM ISO - FLOW FURNACES**

# by any comparison

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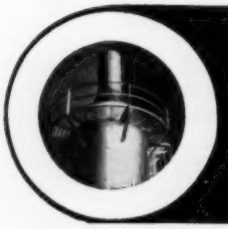

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# Why Burn Down Your House for Roast Pig?

IN ancient China, men ate meat raw. But one day, while Ho-ti the swineherd gathered mast for his hogs, his stupid son Bo-bo, playing with fire, burned down their straw hut. Bo-bo sniffed the odor of burnt pig. He touched one to see if it was still alive, scorched his fingers, put them in his mouth and was amazed at the delicious taste. Father came home and caught his son devouring a pig. Ho-ti tried one, too, found it intoxicatingly sweet and satisfying.

Thereafter, neighbors observed feverish building of new straw huts at Ho-ti's, followed always by conflagrations. The secret leaked and fires became widespread. In a few weeks even his Lordship's town house was on fire. Finally, straw for hut building disappeared from the market and young pigs could not be had for love or money. At last, after many generations, a wise man arose who said that a pig could be roasted without burning down an entire house.

Thousands of years later, we Americans feast deliriously on "roast pig." Accompanying our delights are fires of inflation, which can destroy our values just as certainly as the roasting of Ho-ti's pigs consumed his earthly possessions. But surely we need not await the coming of a sage to tell us not to burn down our houses to enjoy the delights of roast pig!

Let us unite to stop the ruinous flames of inflation. Curb wasteful and unnecessary government spending. Balance our Federal budget. Control our national debt and reduce taxes. Only in this sane way can we produce more straw and enjoy our houses, raise more pigs and eat them, too.

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are now building on their sites in Amsterdam,
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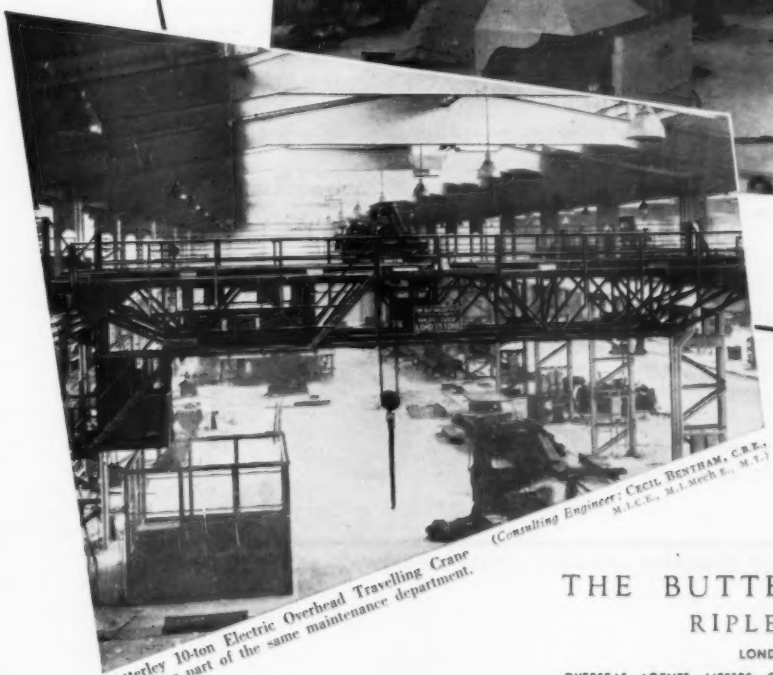
THIS PLANT WILL START PRODUCTION IN 1953

# ELECTRIC OVERHEAD TRAVELLING CRANES

# by BUTTERLEY

30 ton Butterley Electric Overhead Travelling Crane recently installed in the maintenance department of an important steel works.



Butterley 10-ton Electric Overhead Travelling Crane in another part of the same maintenance department.

(Consulting Engineer: CECIL BENTHAM, C.B.E., M.I.C.E., M.I.Mech.E., M.I.)

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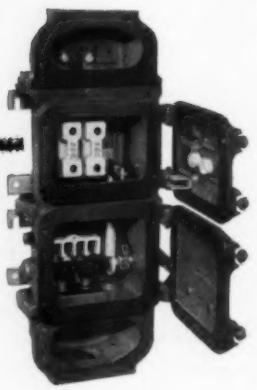
*Typical flameproof distribution board.*

# G.E.C. Flameproof

## SWITCH FUSES & DISTRIBUTION BOARDS

To B.S. 229 & B.S. 861

*660 v. switch fuse unit with terminal box.*



For controlling power and lighting circuits where flameproof gear is necessary in positions such as Mines, Petroleum Refineries and similar installations. The units have a maximum capacity of 100 amps. 660 v. and are readily adaptable to individual requirements, each component being housed in a separate cast iron flameproof enclosure. Approved for groups I, II and III gases by Buxton Certificates.

THE GENERAL ELECTRIC CO., LTD., OF ENGLAND, MAGNET HOUSE, KINGSWAY, LONDON, W. C. 2

## *Oil makes her a sportswoman . . .*

Instead of working all of her afternoons away in her home – the way her grandma and mother had to – this young housewife has time for outdoor exercise and recreation. She has this time because she has many conveniences that ease and speed her chores – washing machine, vacuum cleaner, automobile, oil heat, detergents – to list just a few. Each one of these conveniences – and hundreds more that simplify the work of living – has been made possible through the progress of the petroleum industry. The Texas Company has played a distinguished part in this progress – and is constantly searching for new ways to put oil to work – to help improve the standard of living for all the world.

*The Texas Company*

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QUESTION

# To What Extent is Du Pont Responsible for Tetraethyl Lead Antiknock Compound?

ANSWER

DU PONT is wholly responsible for developing the only safe commercial method of producing tetraethyl lead.

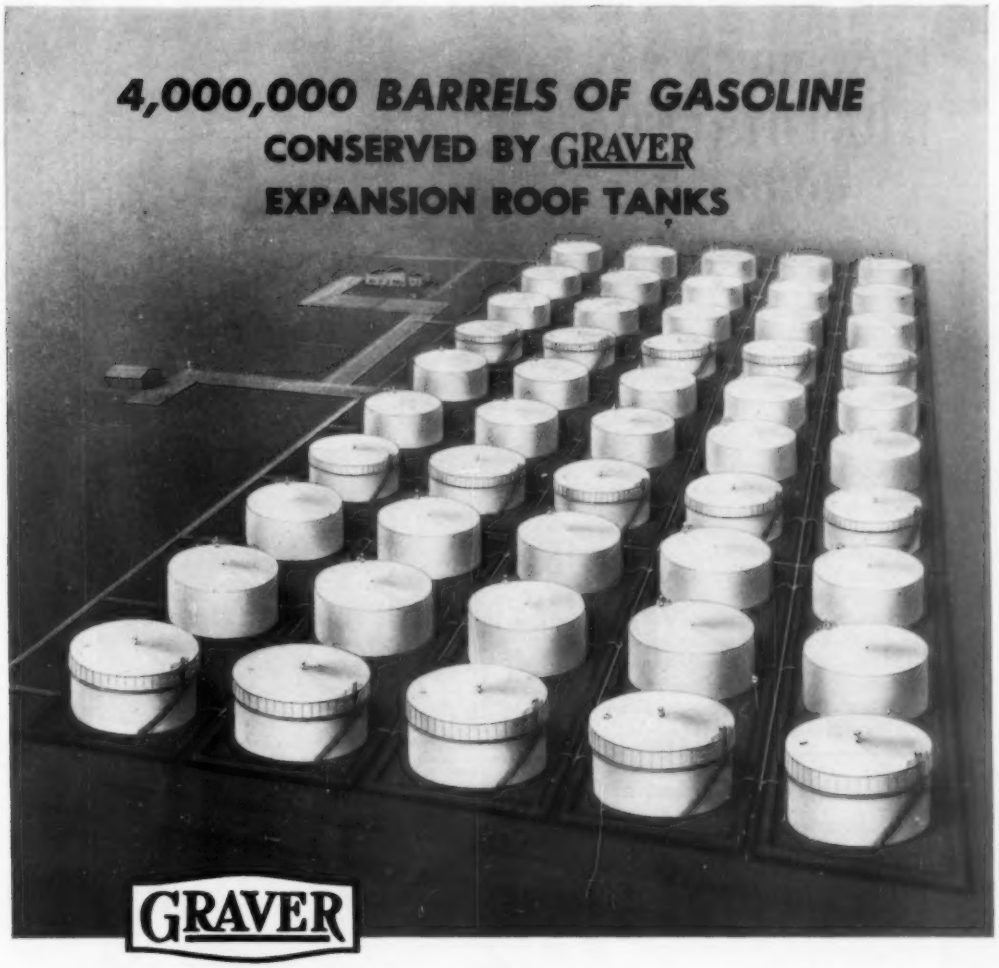
And, from 1923 to September 1945, Du Pont was the sole user of this method and the only manufacturer of TEL in the United States.

Today, wherever tetraethyl lead is made, the basic principles developed by Du Pont are still in use. But, in Du Pont plants only, a new and better method will soon be introduced. This too is exclusively a development of Du Pont's experience and research.

The many Du Pont services available to refiners, like its manufacturing facilities, are based on 150 years of continuous research and sound business practice. That's why more and more refiners are calling on Du Pont for technical advice and research assistance as well as marketing help and other services.

Petroleum Chemicals

E. I. DU PONT DE NEMOURS & CO., (INC.) • Petroleum Chemicals Division, Wilmington 98, Delaware



This mammoth terminal of fifty 80,000-barrel tanks—rarely duplicated in any actual installation—represents the extraordinary record of product savings accomplished by the many Graver Expansion Roof systems throughout the country in the dozen years since the design was introduced to the petroleum industry. According to currently accepted evaporation loss factors, it is conservatively estimated that the Graver Expansion Roof has saved 168,000,000 gallons of gasoline—a gallon for every man, woman and child in the United States.

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# How much can WORTHINGTON do for a refinery?

For many decades, Worthington has been known around the world for refinery equipment and the engineering service that goes with it.

If you were to classify this equipment and service into 3 product lines and 3 services, you might do it something like this:

Equipment: **1. Process pumps, 2. Gas-engine compressors, 3. Refrigeration equipment.**

Service: **1. Before you buy, 2. When you buy, 3. After you buy.**

If you're not already familiar with it, you'll want to learn more about these well-known Worthington products and engineering aids. You can do this by calling on your nearest Worthington representative or by letter—stating specific requirements—to Worthington Corporation, Export Department, Harrison, N. J., U.S.A.

## *What Worthington Engineering Service Means To You*

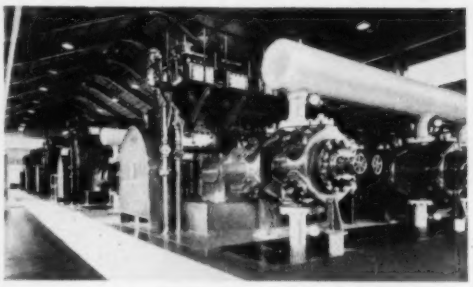
**1. Before you buy,** Worthington gives valuable advice in the correct selection of equipment for each specific application. You benefit from Worthington's century of experience.

**2. When you buy,** Worthington engineers are available to supervise installation, advise operators and maintenance men and to see that equipment operates properly.

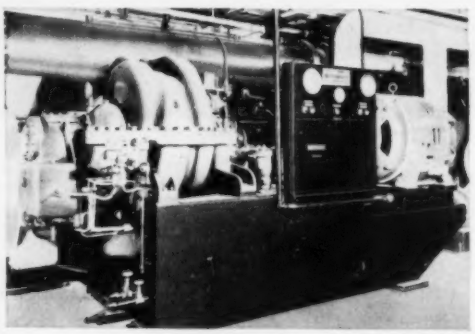
**3. After you buy,** Worthington provides competent service—engineering advice on new problems, quick availability of spare parts.

You can buy Worthington products manufactured at these plants in corresponding local currency: Argentina, Austria, Brazil, England, France, Germany, Italy, Mexico, Spain, U.S.A. F-2.33

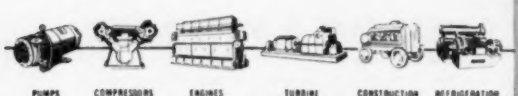
PROCESS PUMPS—the right pump for every job. Many thousands of standard combinations, capacities, casings, mounting and drive arrangements. To oilmen around the world, Worthington means the *world's broadest line* of pumps.



GAS ENGINE-COMPRESSORS—like these five of 25 similar units on the newest gas pipeline in the U. S.—offer operating flexibility and efficiencies only now available after many years of Worthington research.



REFRIGERATION EQUIPMENT—like this installation of centrifugal compressors—is part of the complete Worthington refrigeration line that includes horizontal compressors, booster compressors, vertical ammonia compressors as well as other lines.

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Today, Mobiloil is better than ever. Scientific tests with radio-active tracers prove that heavy-duty Mobiloil with new super-detergent formula can materially stretch engine life, help improve oil economy.
It is continual improvement like this that makes Mobiloil the world's largest-selling motor oil.
WORLD'S LARGEST-SELLING MOTOR OIL—
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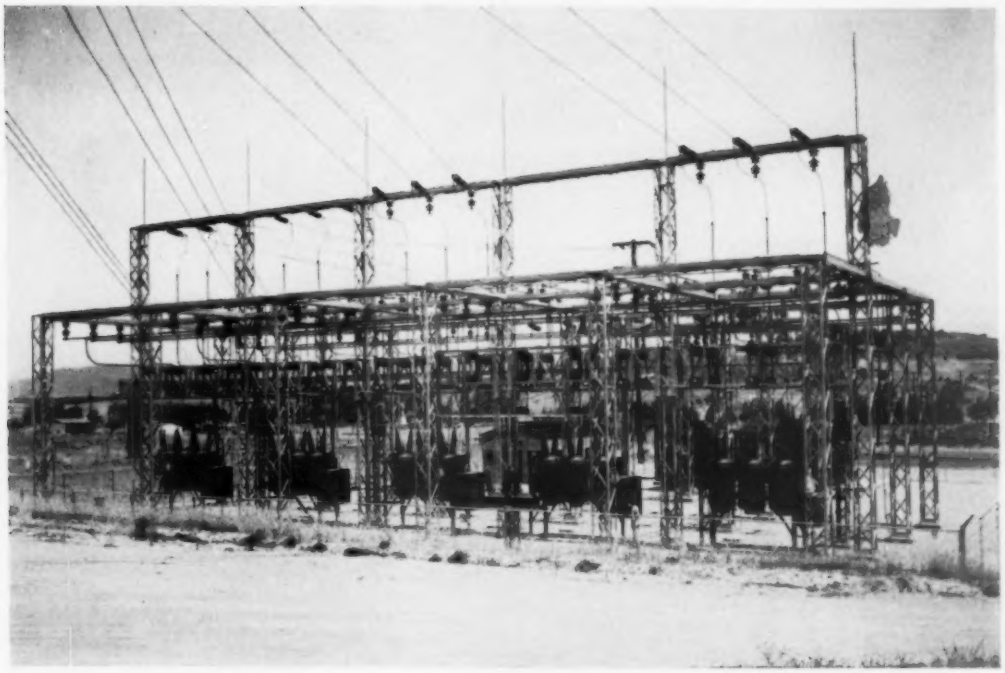
# OILMEN CUT POWER-SYSTEM COSTS

## with New G-E PACKAGE SUBSTATION!



• **THIS NEW, PROVED WAY** to cut power-system costs is simple and effective. Every G-E package substation is *designed* and *built as a unit* . . . thus co-ordinating all components more easily than by any other method. This new concept means you . . .

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• **SAVE TIME!** Units arrive at your refinery in factory-assembled sections as large as shipping and handling facilities will permit. Plans for your outdoor station are already complete, components are either in stock or can be manufactured repetitively. No parts to wait for, no "forgotten" items. G-E outdoor stations go on the line much quicker than a station ordered, manufactured, and installed "piecemeal."

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—U.S.A.—

*"Considering the responsibilities now visible on our industry's horizons, we realize oilmen must continue to play an extremely important part in the constructive development of our world. The future is calling for leadership inspired by the kind of democratic principles which have shaped the oil industry. As an oilman, I am proud of our past record and look forward eagerly to the opportunity of even greater service to the world."*

*From a speech by Eugene Holman, President, Standard Oil Company (New Jersey)*

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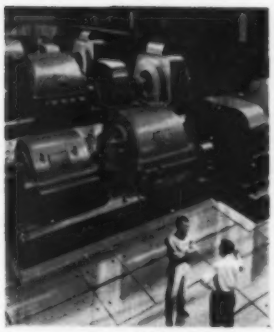
**DRESSER INDUSTRIES, INC.**
OIL, GAS AND CHEMICAL EQUIPMENT

ATLANTIC BUILDING DALLAS, TEXAS

**Magnet Cove Barium Corp.,** ***Houston, Tex., Malvern, Ark., Greybull, Wyo.*** Magcobar drilling mud, Magcogel bentonite, Mylojel, Fiber Seal, Jel-Oil mud.



**Roots-Connersville Blower Division,** ***Connersville, Ind.*** Rotary positive blowers, gas pumps; centrifugal blowers, exhausters; positive displacement meters.

## *Companies' services to the Oil Industry is the Dresser plus +*

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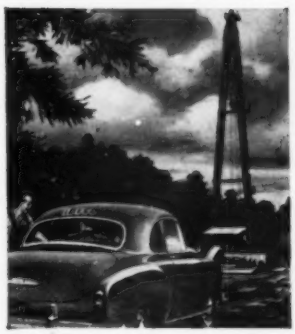
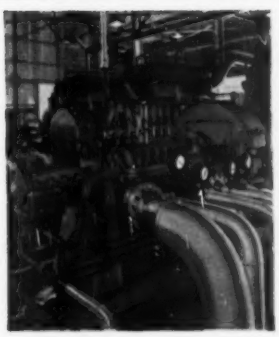


**Ideco Division,** ***Dallas, Beaumont, Tex., Torrance, Calif.*** Derricks, drawworks, rambler drilling rigs, traveling blocks, rotary tables.

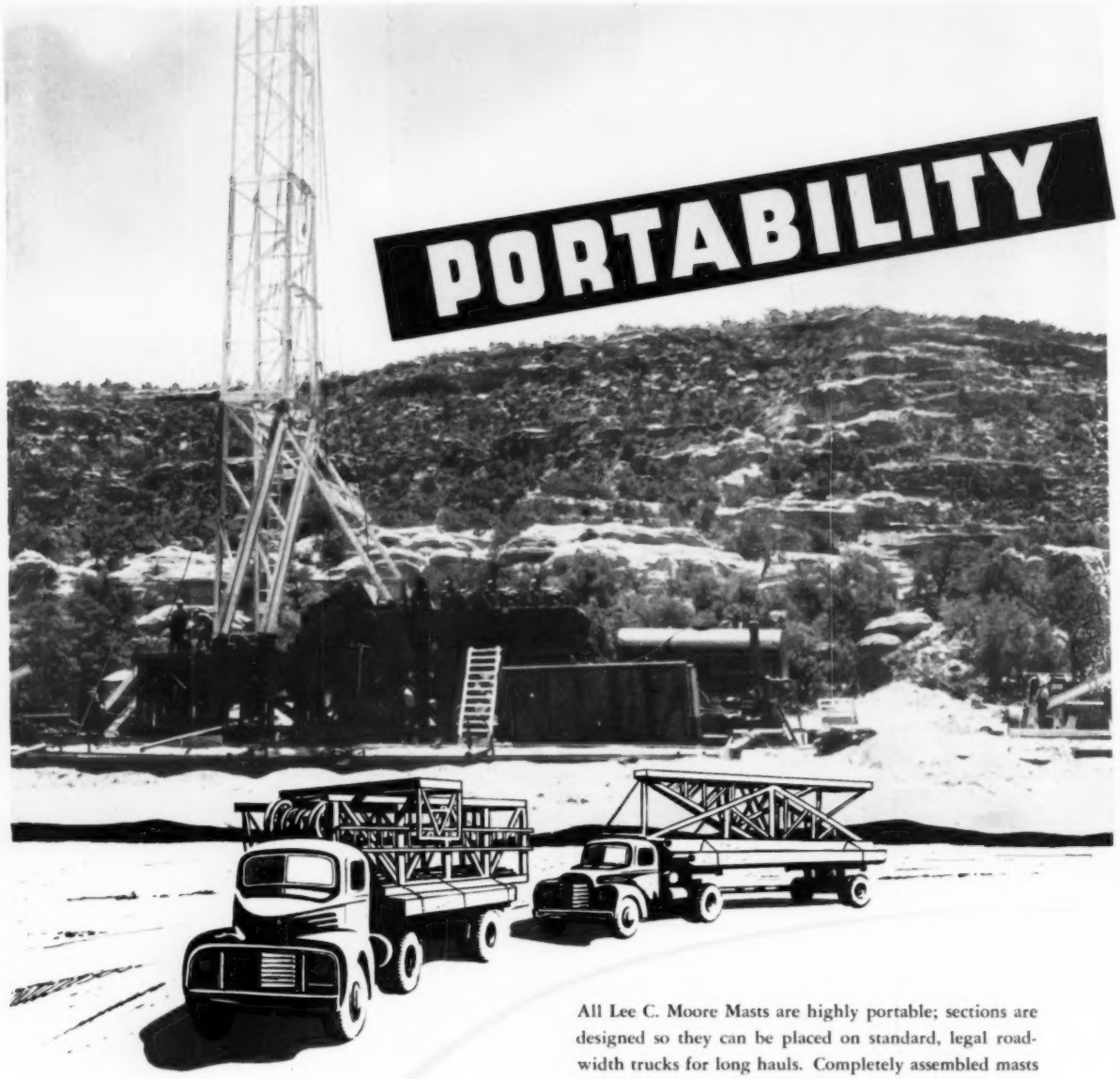
**Kobe, Inc., Division,** ***Huntington Park, Calif.*** Complete hydraulic oil field pumping systems, including the Kobe Free Pump.

**Pacific Pumps, Inc.,** ***Huntington Park, Calif.*** Centrifugal pumps, deep oilwell plunger pumps, hot oil and boiler feed pumps.



**Dresser Manufacturing Division,** ***Bradford, Pa.*** Oil and gas and pipe couplings, fittings and sleeves — rolled and welded rings — welding fittings and flanges.

# PORTABILITY



All Lee C. Moore Masts are highly portable; sections are designed so they can be placed on standard, legal road-width trucks for long hauls. Completely assembled masts can be hauled with blocks strung. Special design features of substructure facilitate skidding from one location to another without removing rigging.

A complete range of Lee C. Moore masts is available in sizes from 87' to 142'

*Write for Information*

LEE C. Moore

**LEE C. MOORE CORPORATION** TULSA • DALLAS • HOUSTON • MIDLAND • SHREVEPORT
WICHITA • CENTRALIA • PITTSBURGH • Export Office — Room 624, International Bldg., 630 Fifth Ave., New York 20, N. Y.

# FOR MORE RAPID LAYING OF PIPELINE

The production and piping of oil has been said to depend upon compressed air more than any other single form of power. Compressed air from the first moment of site preparation . . . compressed air for trenching and rock drilling in the extension of the vital pipelines . . . compressed air for the multitudinous items of maintenance. In applications such as these, three factors must outweigh all others — outstanding reliability in compressors to ensure a continuous supply of air . . . the highest degree of efficiency in compressed air tools to ensure the economical use of that air . . . and a really extensive range of equipment to provide a tool for every purpose. Because CP meets these requirements in full measure, it certainly pays to . . .

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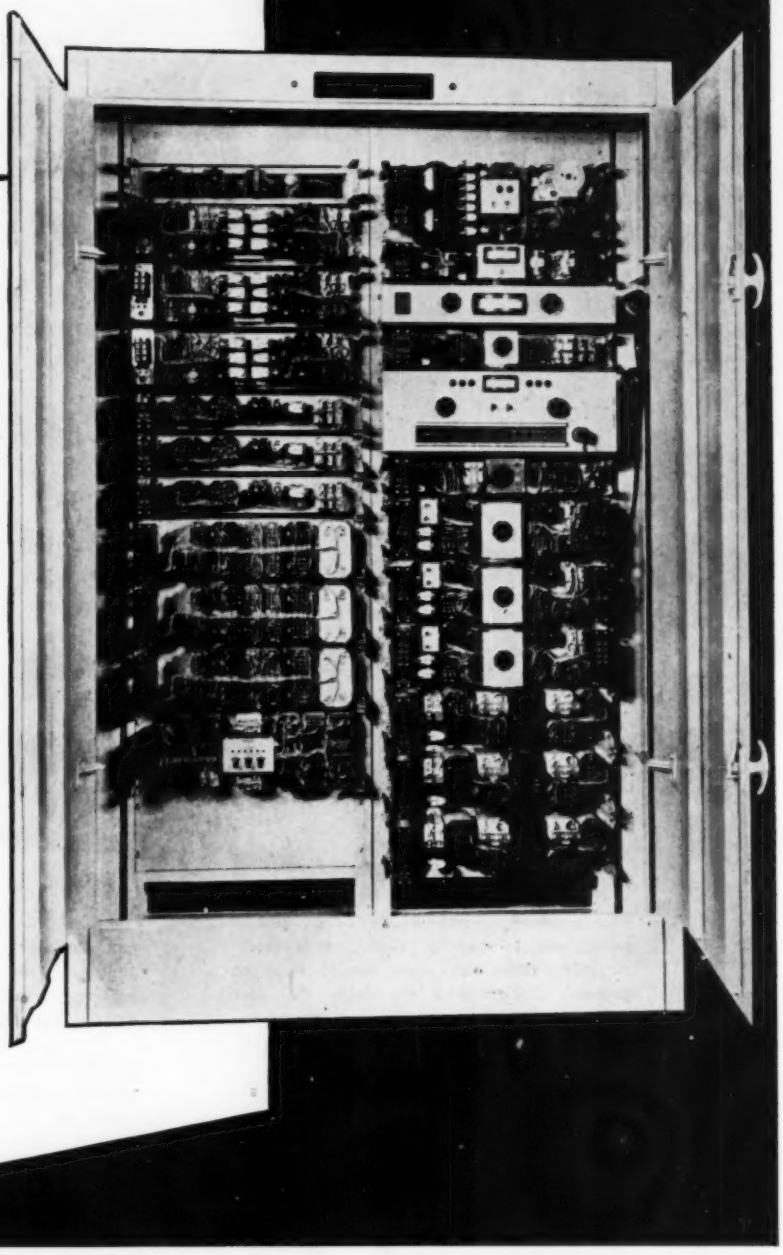
CONSOLIDATED PNEUMATIC TOOL CO. LTD. – LONDON & FRASERBURGH

Offices at Glasgow • Newcastle • Manchester • Birmingham • Leeds • Bridgend • Belfast • Dublin • Johannesburg
Bombay • Melbourne • Paris • Rotterdam • Brussels • Milan • and principal cities throughout the world.

**ATE/TMC**

**OPEN WIRE AND CABLE LINE TRANSMISSION EQUIPMENT**

# Cabinet Mounted Carrier Telephone Equipment



This 3-Channel Carrier Telephone system on two short racks is assembled in a steel cabinet with lockable doors. It is proving extremely useful for installation in buildings with low ceiling heights and the doors provide some security against wilful tampering. The equipment is complete with power supplies, testing equipment and alarm facilities.

**AUTOMATIC TELEPHONE & ELECTRIC COMPANY LIMITED**

*RADIO AND TRANSMISSION DIVISION:* STROWGER HOUSE, ARUNDEL STREET, LONDON, W.C.2

*Telephone:* TEMple Bar 9262 *Cablegrams:* Strowgerex, London

*Manufacturers:*

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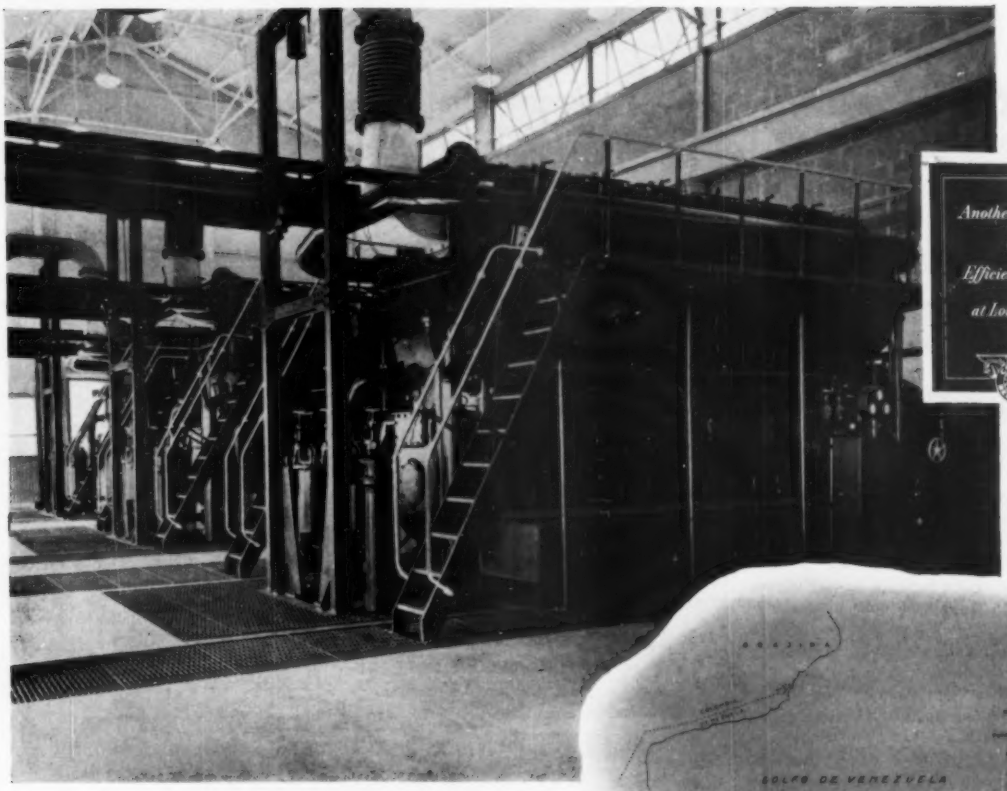
TELEPHONE MANUFACTURING CO. LTD. - - - - - - - - - - - - - - - - - - St. Mary Cray, Kent



*Another Example of Efficient Power at Lower Cost*

# COOPER-BESSEMER LSV's ON VENEZUELA'S NEW "LIGHTLINE"...

## A NEW HIGH IN *flexibility and smooth performance...*

THE three LSV-12 Gas-Diesels shown here, installed at Palmarajo de Mara, power the new 30", 165-mile line operated by Shell Caribbean Petroleum Company. Not only is this a remarkably quiet, "sweet running" station with an extreme minimum of vibration, but its operators consider it the ultimate in flexibility.

For example, the engines have automatic speed control, with provision for manual control from the main switchboard or from the panel at each engine. The automatic control is governed by the discharge pressure of the station (pumps in series), thus automatically balancing the load between the units. Pipe line safety is further assured by high pressure, high-flow engine shutdown devices.

On the whole, here's more evidence that for pipe line pumping . . . for *any* stationary service . . . modern Cooper-Bessemers are your best bet.

**The Cooper-Bessemer Corporation**

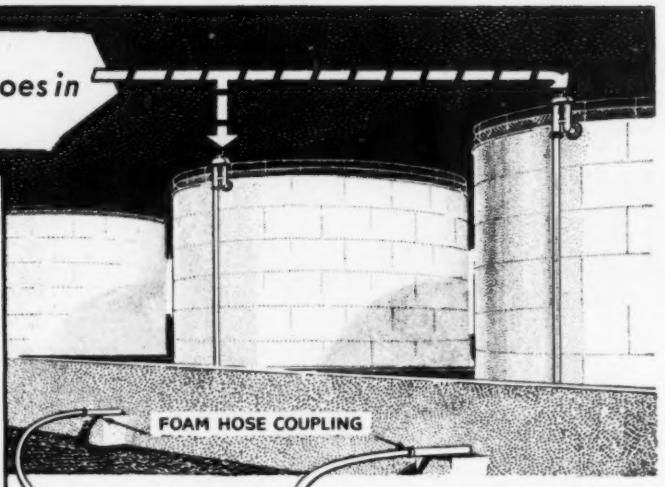
MOUNT VERNON, OHIO — GROVE CITY, PENNA.

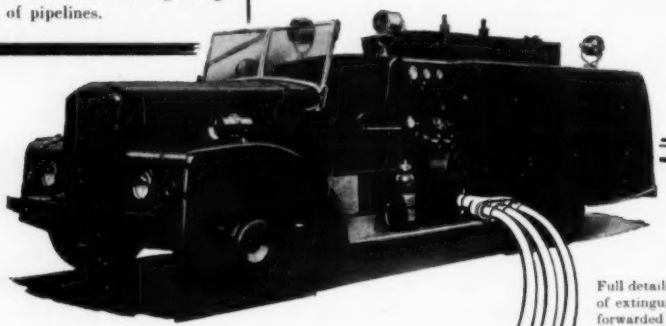
New York City Washington, D. C. Bradford, Pa. Parkersburg, W. Va.
San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas
Seattle, Wash. Shreveport, La. St. Louis, Mo. Los Angeles, Calif.
Caracas, Venezuela Gloucester, Mass. Tulsa, Okla. New Orleans, La.

# FIRE goes out...

## when FOAM goes in

This method of fighting oil and spirit fires has already been installed at a number of Refineries. It provides the quickest and most practical means of delivering Foam to Refinery Plant or Oil Tanks in the event of fire. The "PYRENE" Foam Tender makes it possible to convey to the scene of the outbreak the required foam compound, foam generating equipment, pump and all fittings for coupling up to the Hydrants or Static Water Tanks and Foam Risers on the tanks. With this fire-fighting vehicle the finest mechanical foam can be delivered on to the surface of the blazing oil without necessitating long runs of pipelines.



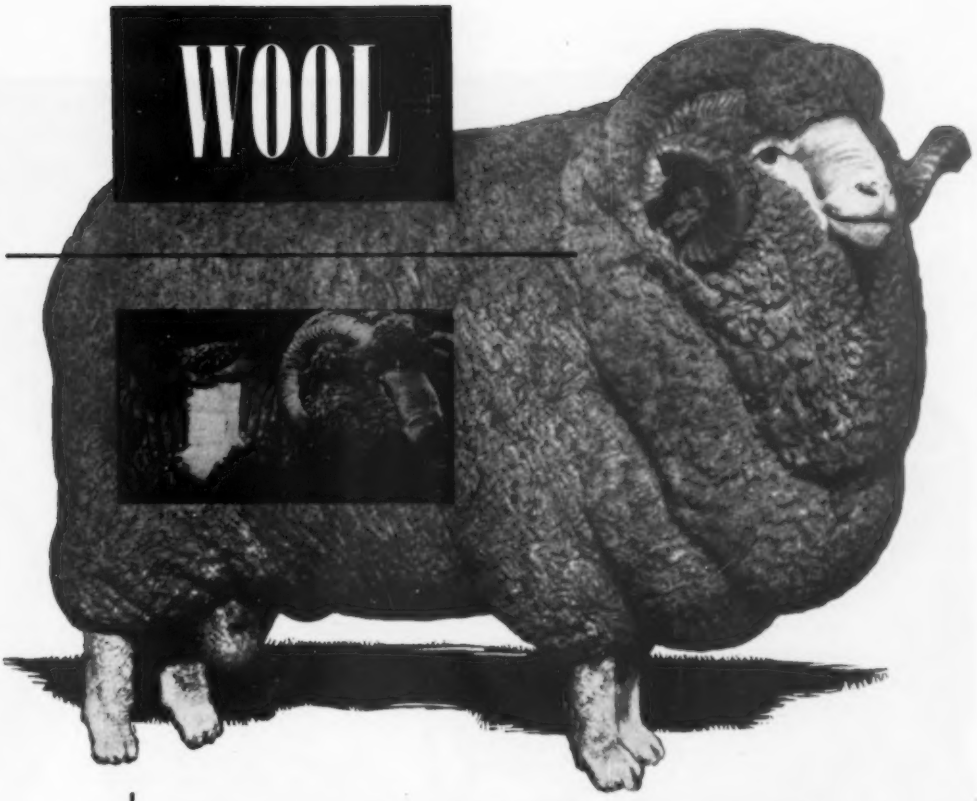
This particular "PYRENE" Foam Tender carries 600 imperial gallons of "PYRENE" Foam Compound, Two No. 20 and one No. 10 "PYRENE" Mechanical Foam Generators and four F.B. 10 Portable Foam Branchpipes. It is capable of producing 4,500 imperial gallons of Foam per minute for 30 minutes without replenishment.

Full details of this and other modern methods of extinguishing Oil and Spirit Fires will be forwarded without obligation. Please send your enquiry to Dept. W.P. 11.

Pyrene TRADE MARK
FIRE FIGHTING EQUIPMENT

**THE PYRENE COMPANY LTD.**, 9, Grosvenor Gardens, London, England
Cables: "Pyrene London".
Head Office and Works: Great West Road, Brentford, Middlesex.
Associated with: — Pyrene Manufacturing Company, Newark, New Jersey, U. S. A. and Pyrene Manufacturing Company of Canada, Limited, Toronto, Ontario, Canada.

# WOOL



## *wealth of the Commonwealth*

Throughout the world
WOOL means **warmth**...
protection and
comfort for
man, woman, child.

And, throughout the world,
AUSTRALIAN WOOL
means **fine** wool...
soft, fleecy, **quality** wool.

Australia's
112-million sheep
today provide
**1 out of every 4 pounds**
of the world's supply...
**more than half**
of all the top-quality
Merino wool.

Wool is **one-third**
of Australia's
total export trade...
accounts for **one-tenth**
of the national income.

**Another** mighty important
commodity
to Australians is
**OIL**...

The petroleum products
which have aided
industrial expansion...
which give power,
light, warmth...
which fuel and lubricate
all manner of
modern transport.

More than a **billion**
imperial gallons
of oil products
each year
are the **life-blood**
in the arteries of
the Australian Commonwealth...
are helping to build
a stronger nation...
a better way of life
for the Australian people.

In Australia, as elsewhere
in the Eastern Hemisphere,
people know
they can depend on
the Stanvac organization
to supply this vital oil.

**STANDARD-VACUUM OIL COMPANY**

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STEELS

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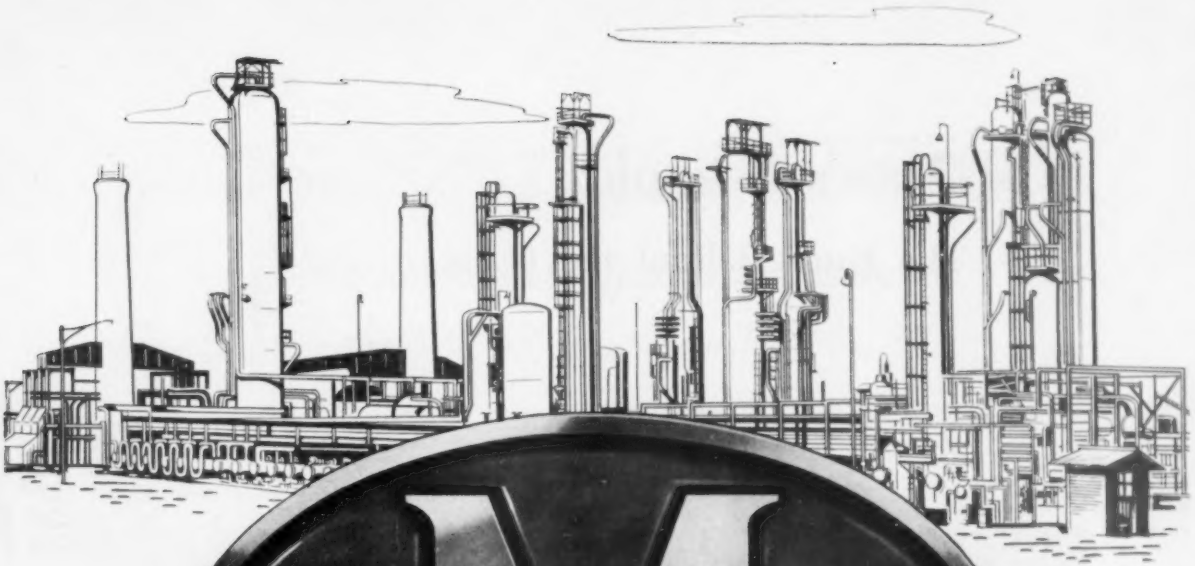
THE UNITED STEEL COMPANIES LTD

This organisation has made a special study of steel requirements of the petroleum industry: plates for fusion welded vessels; constructional steel; forgings; alloy steels, including corrosion and heat-resisting types; etc. The Technical Departments will be pleased to discuss specific applications with manufacturers of petroleum equipment.



# The Mark of Sound Refinery Engineering

THIS is the mark of McKee engineering. To oil men all over the world it means sound process and plant design, thorough, efficient engineering and construction. It is backed by an organization with the integrity and experience, the scope and resources to undertake your refinery project and fulfill the promise that *McKee Engineering means assured results.*

**DESIGN, ENGINEERING AND CONSTRUCTION FOR THE PETROLEUM REFINING AND IRON AND STEEL INDUSTRIES**

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*Headquarters:* McKee Building, 2300 Chester Avenue, Cleveland 1, Ohio.
*New York Office:* 30 Rockefeller Plaza, New York 20, N.Y. • *Washington Office:* 1507 M Street, N. W. Washington, D. C. • *England:* The Iron and Steel Division of Arthur G. McKee & Company is represented by Head, Wrightson & Company, Ltd.
*District Engineering Offices:* Union, New Jersey and Tulsa, Oklahoma.

# Oil-Man's Bazooka

## The Guns Behind the Guns

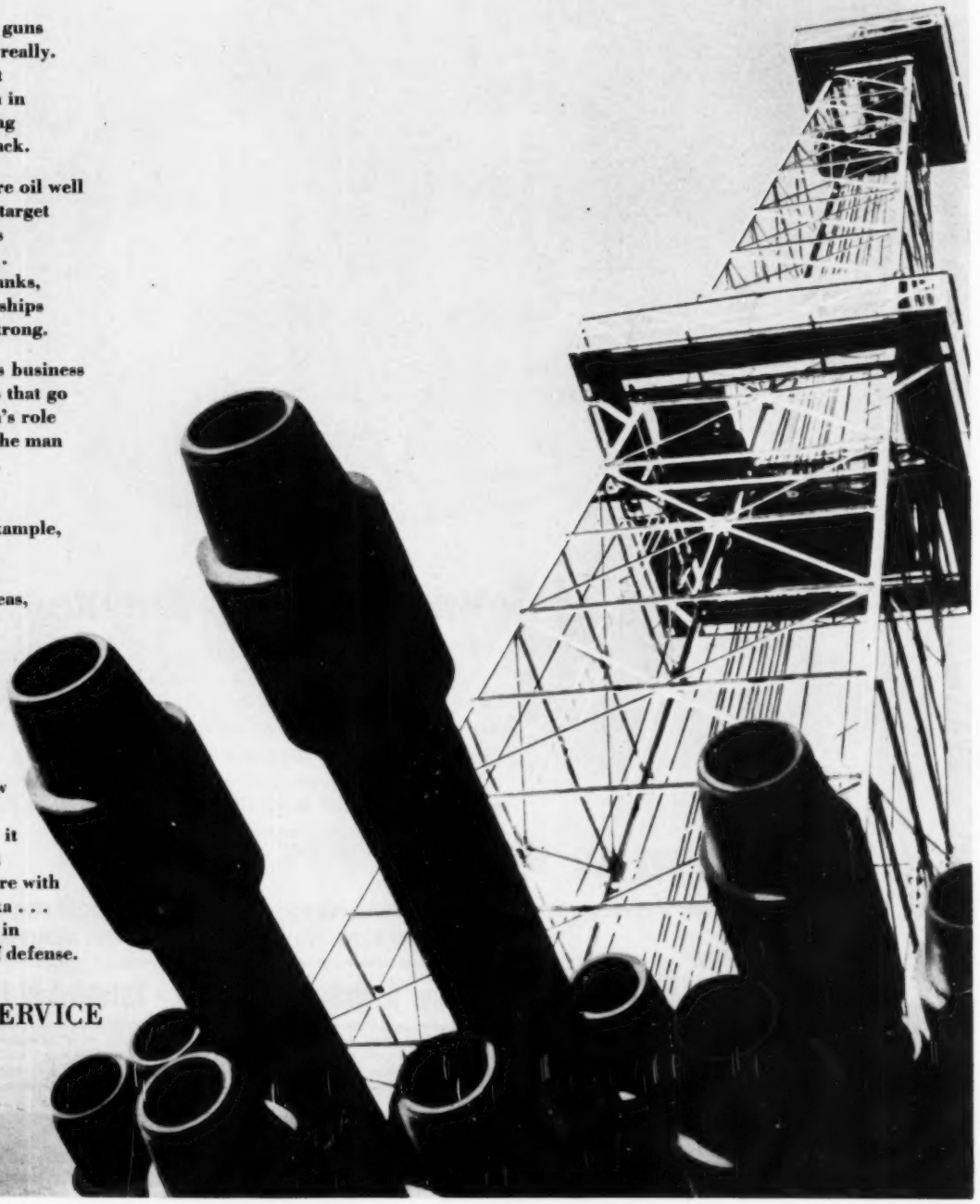
**The guns behind the guns aren't shootin' irons really. Yet, if they didn't hit their target, our men in Korea would be sitting ducks for enemy attack.**

**The guns we mean are oil well drill stems . . . their target the crude oil that lies beneath the earth . . . destined to fuel the tanks, the planes, the battleships that keep America strong.**

**There is more to this business of defense than guns that go "bang." The oil-man's role is as vital as that of the man who makes rifles . . . or atomic bombs.**

**Cities Service, for example, as an expanding, or "growth" company, has a stockpile of ideas, plans . . . blueprints for the future. During the last war these blueprints made it possible to swing into the production of new products to meet new and urgent military demands. So, today, it stands ready to meet demands of the future with the oil-man's bazooka . . . an essential weapon in America's arsenal of defense.**

CITIES SERVICE



# Westinghouse Controls Stand Guard

## *for the Mene Grande "Navy"*

***Maintenance men ride*** to work in power launches at Mene Grande's 500-well underwater oil field on Lake Maracaibo in Venezuela. At many of the wells their job is a lot easier because Westinghouse automatic controls stand guard 24 hours a day over continuously operating pumping motors.

This weatherproof oil well pumping control for single-speed, squirrel-cage motors has proved its dependability in operations where it is impractical to post a man at each well. Providing across-the-line motor starting with complete overload and low-voltage protection, this Westinghouse control does more than merely trip off when trouble develops. If a temporary overload occurs, the control keeps the motor operating. If the overload persists, however, the control shuts down the motor before the danger point is reached. Control cabinet is suitable for surface or pole-mounting.

An optional feature of the control which pays big dividends in multi-well operations such as the Mene Grande field is the Westinghouse AM Relay Timer. This prevents system overloads after power failure by automatically restarting motors in staggered sequence.

***We'd like*** to tell you more about this automatic pumping motor control as well as other Westinghouse equipment for oil field electrification. Write for your free copy of our new booklet B-4039.

YOU CAN BE **SURE** ...IF IT'S

# Westinghouse

WESTINGHOUSE ELECTRIC INTERNATIONAL COMPANY

40 Wall Street, New York 5, U. S. A.

# NO WONDER YOU SEE SO MANY

# Whites IN THE OIL INDUSTRY

**WHEREVER** you go in the oil industry . . . exploring, drilling, producing or delivering . . . you'll see dependable White Trucks on the job.

Tailored right to their exact work requirements, Whites are doing an amazing job, helping to step up production in the oil industry's tremendous expansion.

Based on accurate cost records of leaders in the industry everywhere, Whites not only substantially cut transportation costs, they add new efficiency and last longer on the really rugged jobs.

Here's why they cost less . . . earn more . . . in oil industry service . . .

**WHITES**

## DO MORE WORK

**BIG JOBS** really move! White six-wheelers—gasoline or diesel-powered—are doing a great job in oil field service, moving drilling rigs and other heavy oil field equipment.

**OFF-THE-ROAD** hauling jobs that go by Sterling-White get there faster . . . with no stalling or breakdowns. This special oil field model has plenty of power, wide selection of gear ratios.

**WHITES**

## CARRY MORE PAYLOAD

**DISTRIBUTION** economy and efficiency, too, with the White 3000. In airport service, for example, extra tank carrying capacity and outstanding maneuverability saves time . . . cuts cost.

**DESIGN** advantage of the White 3000 makes it the ideal tanker for transport service because extra tank capacity permitted within legal limits. Operators report up to 30% extra capacity.

SEE YOUR WHITE REPRESENTATIVE FOR FACTS

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# UNIT RIG'S U-20 IS FAST

The Model U-20 Drawworks has proven that it is a fast, smooth economical rig even under difficult drilling conditions. Drill Faster - - - with the SIX speeds to the rotary table ranging from 57 to 626 R.P.M. at maximum engine speed. Hoist Faster - - - with the SIX drum speeds, divided into a high and low range. SPEED - - - for hoisting empty blocks and POWER - - - for raising off slips readily available thru single lever high-low clutch control. Maximum trip speed is attained by the free spooling drum, hydromatic brake pipe "fall" control and the large powerful drum brake.

Buy Speed - - - Buy The Best - - - Buy The U-20

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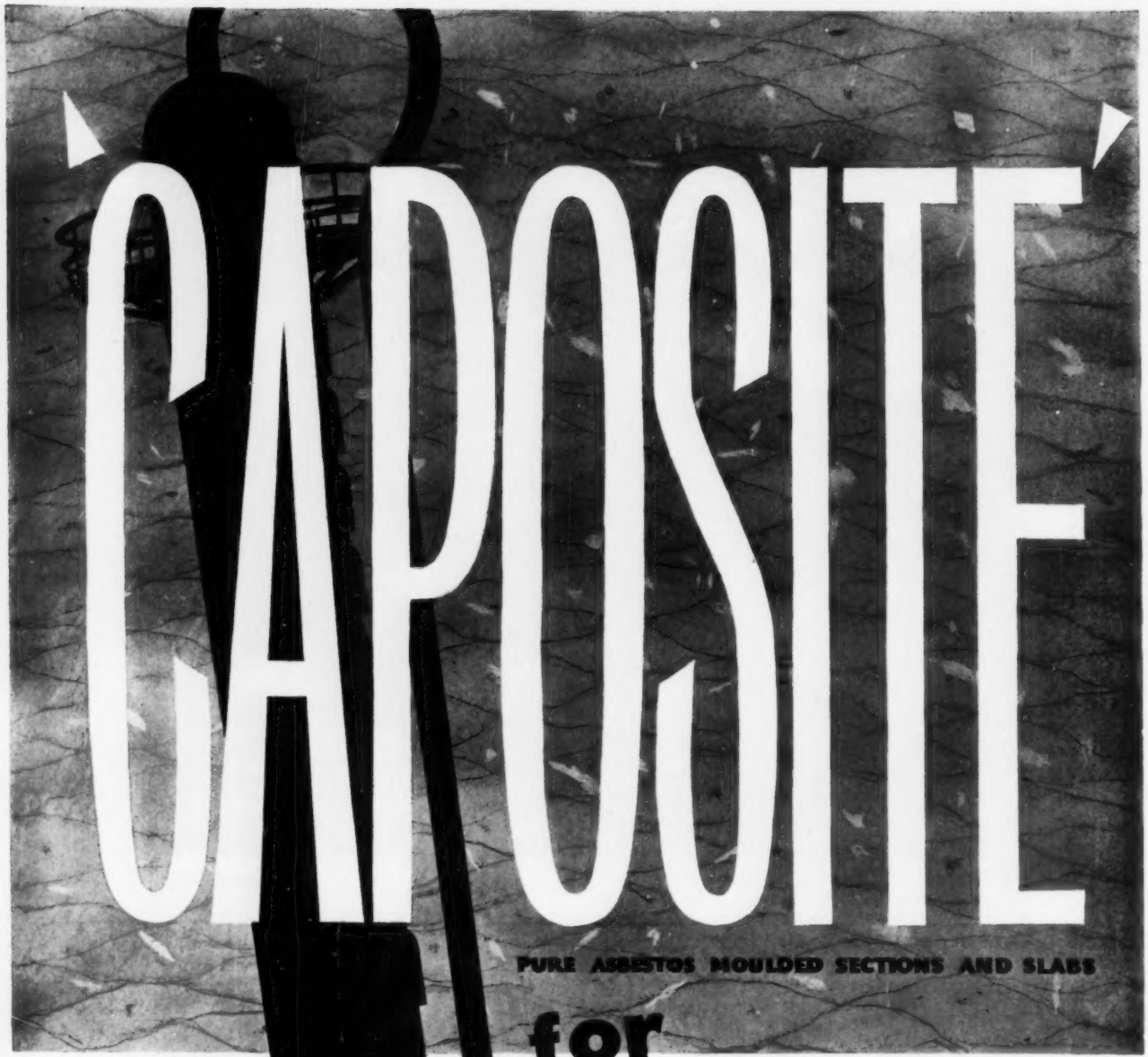


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Refinery

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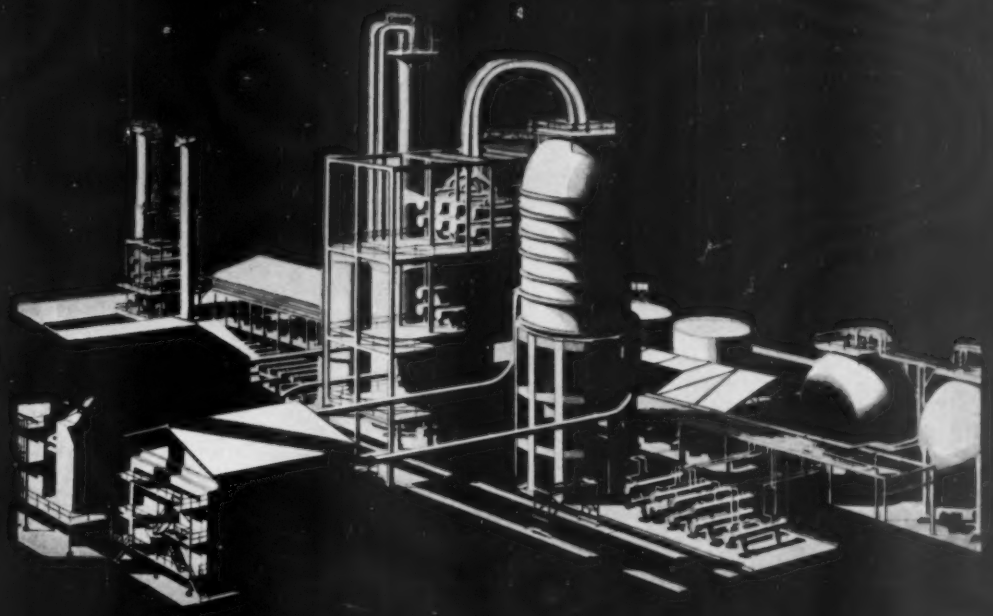
## crude distillation units



FOSTER WHEELER CORPORATION

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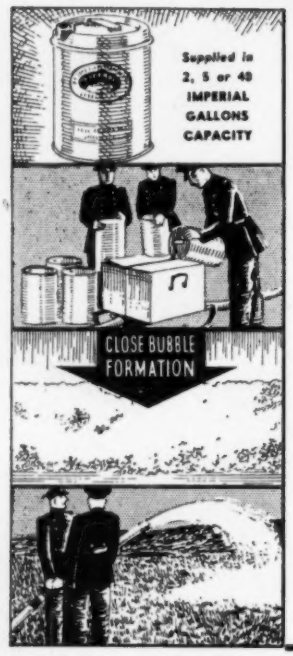
# Kills Oil & Petrol Fires with SPEED & CERTAINTY




★ Nicerol is supplied in heavy gauge steel drums designed for quick release and clean pouring.

★ Nicerol can be used in any type of mechanical foam or air foam apparatus. In this case a base injection type in-line inductor is being operated.

★ The secret of Nicerol effectiveness lies in the small bubble formation. It creates a tough, efficient blanket. 3 gallons of Nicerol and 100 gallons of water will produce over 1,100 Imperial gallons of foam.

★ The above gasoline and oil blaze was extinguished in a matter of seconds by a normal mix of Nicerol Foam Compound.

Meet the hazard of fire with Nicerol, the foam compound that kills any oil or gasoline fire quickly and absolutely. Nicerol is a concentrate, producing a heavy type foam of closely-knit small bubbles which form a tough, vapour-tight blanket over the surface of burning oil or gasoline. It is characteristic of Nicerol Foam that it flows with the fire and is highly resistant to flash-back or re-ignition. It can be used successfully in any type of mechanical foam or air-foam apparatus — is equally effective with salt water or fresh and can be stored for years without deterioration.

***TRADE ENQUIRIES INVITED***

***For further particulars, samples, catalogues, etc.:***

The Royal Navy and the Royal Air Force use it and so do Oil Companies, Fire Equipment Manufacturers, Civil Air Lines, several Commonwealth and Foreign Government departments, and Fire Brigades throughout the world. What better recommendation?

**NICEROL LIMITED, LISBURN, N. IRELAND**

*Telephone: Lisburn 2027* *Telegrams: Nicerol, Lisburn*

*Interplane Sedan designed by Richard Arbib for the VEEDOL "Dream Car" Salon. Equipped with new luxury Federal Flying -A- Safti Ride Tires.*

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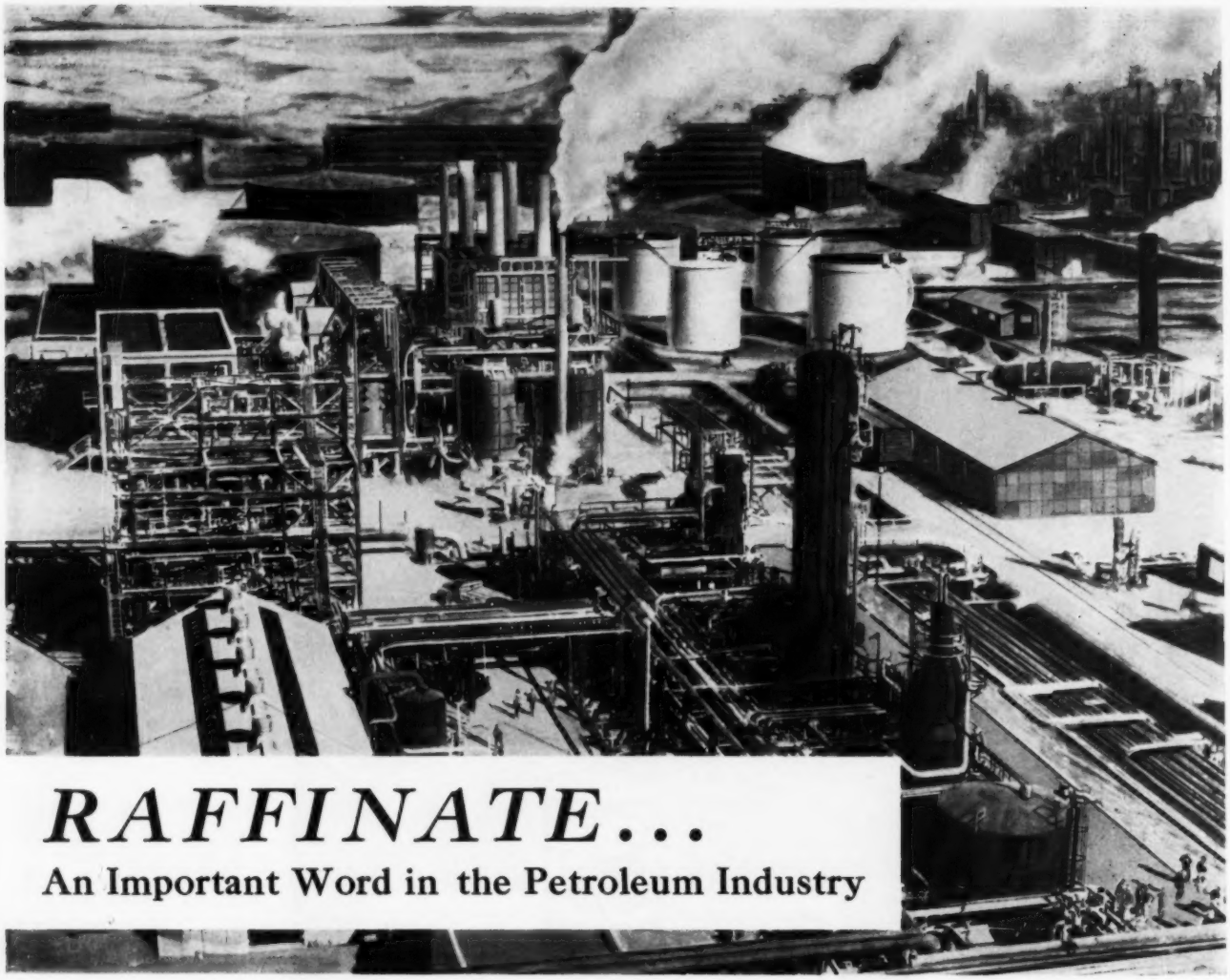
# VEEDOL

**The World's Most Famous Motor Oil**

VEEDOL is a scientifically superior motor oil produced to far exceed the demands placed upon it by today's modern motors. There's "Dream Car" performance aplenty for your car's engine in VEEDOL'S famous "Film of Protection," whether yours is a new car or old car. For VEEDOL can be depended upon to keep motors *cleaner, safer, smoother-running* at all times.

TIDE WATER ASSOCIATED OIL COMPANY



# *RAFFINATE...*

## An Important Word in the Petroleum Industry

*The $SO_2$ Extraction unit of the Phillips Petroleum Company at Phillips, Texas, shown in foreground above, is the second $SO_2$ plant to treat cat cycle stocks. Both plants were designed and built by Badger.*

Catalytic cycle stocks, when extracted with $SO_2$, often give high yields of raffinates of a quality equal or superior to that of the virgin charge. These products may then be blended into premium diesel or similar fuels or reprocessed in the cat cracker with minimum coke.

**STONE & WEBSTER ENGINEERING CORPORATION**

**BADGER PROCESS DIVISION**

**AFFILIATED WITH E. B. BADGER & SONS (GREAT BRITAIN) LTD.**

PETROLEUM CHEMICALS DIVISION
# NEWS

November ★ One of a Series of Interest to the Petroleum Industry ★ 1952

## YOUR CUSTOMERS...Have you recently reminded them of these rules for good driving?

1. Avoid high speeds. Drive at a reasonable speed that will get you there on time.
2. Drive the road ahead. Watch traffic and lights. Pace driving to make as few stops as possible.
3. Make slow easy starts. Shift to high as soon as possible.
4. Under normal driving conditions, don't press the accelerator to the floor.
5. Avoid sudden stops.
6. Adjust seat so legs are comfortable for a light steady pressure on the accelerator. Don't pump the pedal!
7. On open stretches maintain a constant speed.
8. On up-grades don't attempt to maintain constant speed.
9. Be sure tires are inflated to proper pressure.
10. Use the proper grade lubricants for anticipated seasonal weather conditions.

## Complete Manual on Gasoline Dyes Soon Available

***New booklet on Du Pont Gasoline Dyes contains all the information a refiner needs to know about dyeing gasoline.***

Ever since tetraethyl lead was first used as an antiknock compound, coloring has been an important factor in making gasoline.

Gasoline dyes, however, have for a long time presented a number of han-

dling problems. And it was not until recently that efficient methods of addition were worked out.

All of the latest methods of dyeing gasoline are fully discussed in a new booklet, "Du Pont Gasoline Dyes." It covers the dry dye eductor system as well as the various other methods of addition by dye pot.

The booklet also gives complete information – including solubility charts and spectrophotometer curves – on all the Du Pont gasoline dyes. And it contains full data on meeting color requirements for military, aviation and leaded motor gasoline.

In addition, the booklet includes much helpful information on handling dyes; such as how to remove dye stains from clothing and equipment – and useful shipping information.

This booklet will soon be available to refiners through the Du Pont Petroleum Chemicals Division district offices.

# New Dynamometers Broaden Usefulness to Refiners of Du Pont Test Car Fleet

When a car engine knocks, the cause may be from a variety of factors other than gasoline quality. This fact is readily demonstrated to fleet owners or other groups by the new Petroleum Chemicals Division traveling dynamometers which are part of Du Pont's fleet of 53 road octane test cars.

**ROBERTS W. BROKAW, JR.,** Du Pont representative, uses the Du Pont test car and dynamometer combination for demonstrating road knock by the Uniontown method.

Suppose you want to show a customer group the effect of speed, spark advance, air-fuel ratio, operating temperature, and altitude as well as fuel quality on engine performance and octane requirement. The dynamometer and Du Pont test car combination is all that is needed to make a convincing demonstration.

### ANSWERING QUALITY COMPLAINTS

Suppose, on the other hand, you want to refute quality complaints with a dash of real showmanship. The dynamometers can be employed to point up the effect of poor operating maintenance on engine performance . . . by simulating faulty ignition, fouled spark plugs, over-advanced spark timing and improper carburetor adjustment.

*ADVERTISEMENT—Prepared for the Petroleum Chemicals Division of E. I. du Pont de Nemours & Company (Inc.)*

OVER

PETROLEUM CHEMICALS DIVISION
# NEWS

CONTINUED *Dynamometers*

These versatile dynamometers are each equipped with a speedometer, road power meter, fuel flow meter, air-fuel analyzer, intake vacuum gauge and various temperature indicators. An easel and a public address system together with special microphones to amplify the speaker's voice all help make the demonstration clear and understandable.

**FLEXIBLE PROGRAM**

Du Pont automotive specialists have been trained for putting on dynamometer demonstrations. A wide choice of program material is offered and can be readily tailored to meet the specific needs of an individual oil company.

The length of time required for a demonstration is completely flexible . . . ranging from one hour to a full afternoon. And the equipment can be set up outdoors or in any large room or building having adequate ventilation.

Refiners and marketers who are interested in learning about this new sales promotion tool should get in touch with the nearest Du Pont Petroleum Chemicals Division district office for details.

## Bernard Miller Sturgis

Bernard M. Sturgis is head of the Combustion and Scavenging Research Division of the Du Pont Petroleum Laboratory. He is in charge of fundamental research on combustion problems and on the problems associated with deposits in engines, as well as the development of and evaluation of new additives in these fields.

Sturgis joined Du Pont in 1936 after having won a 4-year Thomas A. Edison scholarship which helped him toward obtaining his Ph.D. degree in chemistry at M.I.T.

Among various duties at Du Pont's Jackson Laboratory, he did fundamental research on vulcanization and on the properties of stretched rubber. Later he was made group leader in charge of all research on chemicals for natural and synthetic rubber and on polymerizable monomers. During this time he obtained 27 patents and published several papers in this field.

Before being transferred to the Petroleum Laboratory in 1951, he was head of the Petroleum Chemicals Division of Jackson Laboratory in charge of research on tetraethyl lead, combustion and petroleum additives.

## Copper Picked Up By Gasoline in Pipeline

It is often difficult to trace the exact source of contamination when copper is found in gasoline. Therefore, the following case history of copper picked up by gasoline during pipeline transfer is of interest.

A new products pipeline was recently put into operation by an oil company. Gasoline entering this pipeline with an induction period of 14 hours was found to leave the pipeline 416 miles away with an induction period of 5 hours.

To determine the source of contamination, the copper content of the gasoline was checked at various points along the pipeline. It was found to be building up in proportion to the miles traveled through the line, from .10ppm initially to .22ppm at the destination.

Further investigation showed that engines at the pump stations along the pipeline were being cooled by copper heat exchangers. And it was discovered that gasoline circulating around the copper coils, which carried water at approximately 150°F., was picking up sufficient copper to cause the difficulty. The pump impellers, which were fabricated of an alloy containing copper, were also contributing to the trouble.

At this stage Du Pont Metal Deactivator was used to counteract the copper contamination. It was found that only ¼ lb. of the deactivator per 1,000 barrels of gasoline, added at the pipeline exit, was needed to restore the original 14-hour induction period.

Normally it would be recommended to add Metal Deactivator to gasoline *at the refinery*, before it entered the distribution system.

## LITERATURE AVAILABLE

Here is a partial listing of the bulletins, reports, booklets and aids available to you through your Du Pont Petroleum Chemicals Division district office:

**Safety for the Small Refinery** – A 42-page book on how to set up an effective small refinery safety program . . . . . Serial A-2848

**Tank Talk** – A 52-page, easy-to-understand safety booklet for tank-cleaning crews . . . . . Serial A-1134

**Stability of Present-Day Gasolines** – A 12-page paper on the value of storage tests—as compared with induction period—for determining stability of modern gasolines. Serial A-3199

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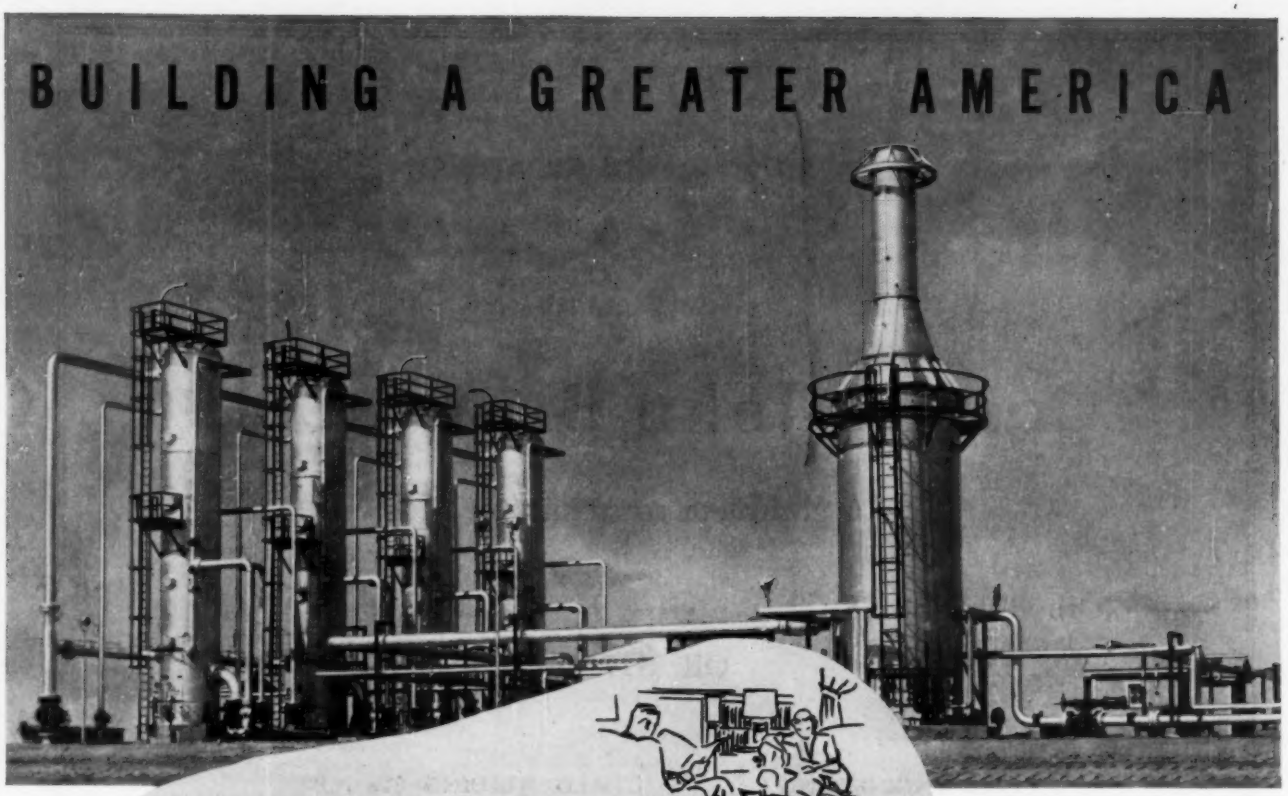

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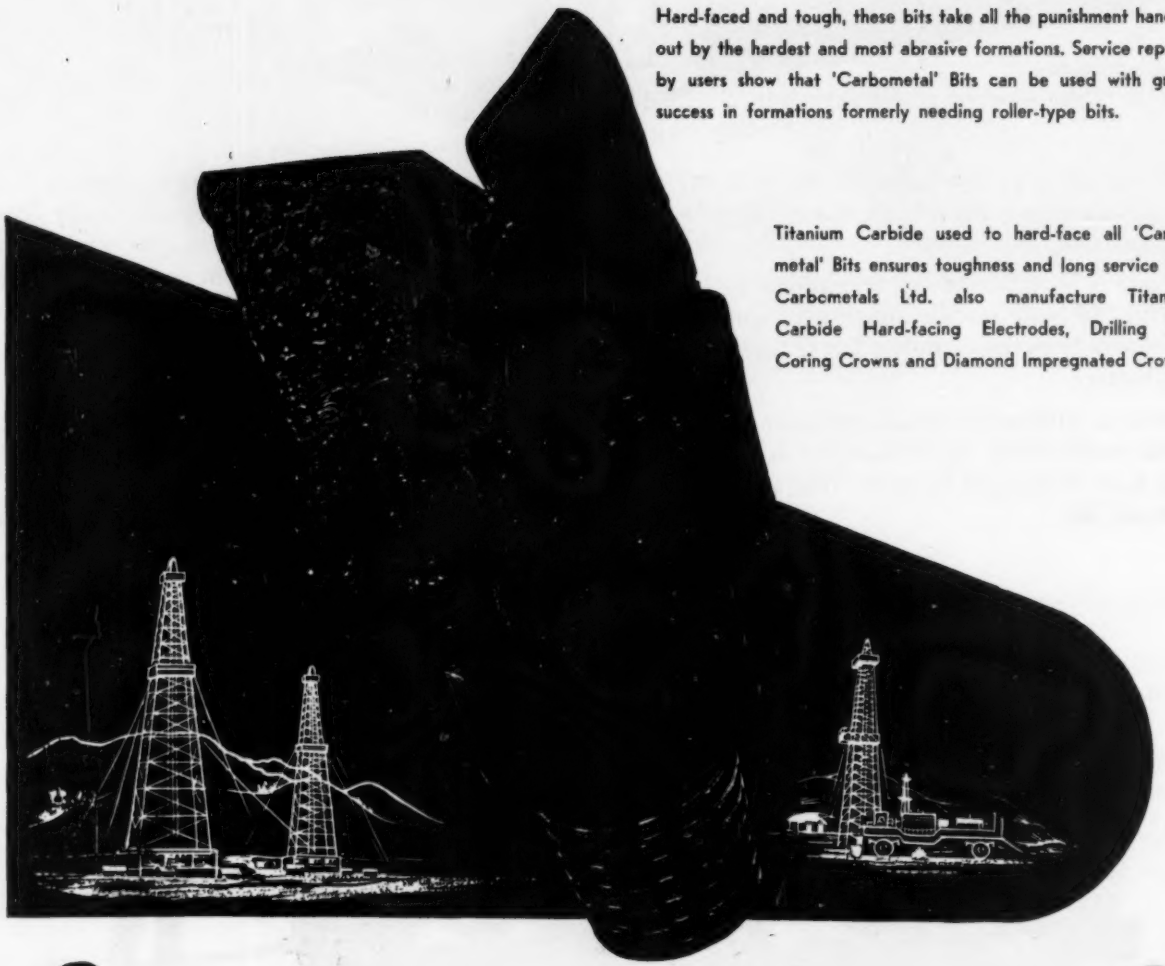

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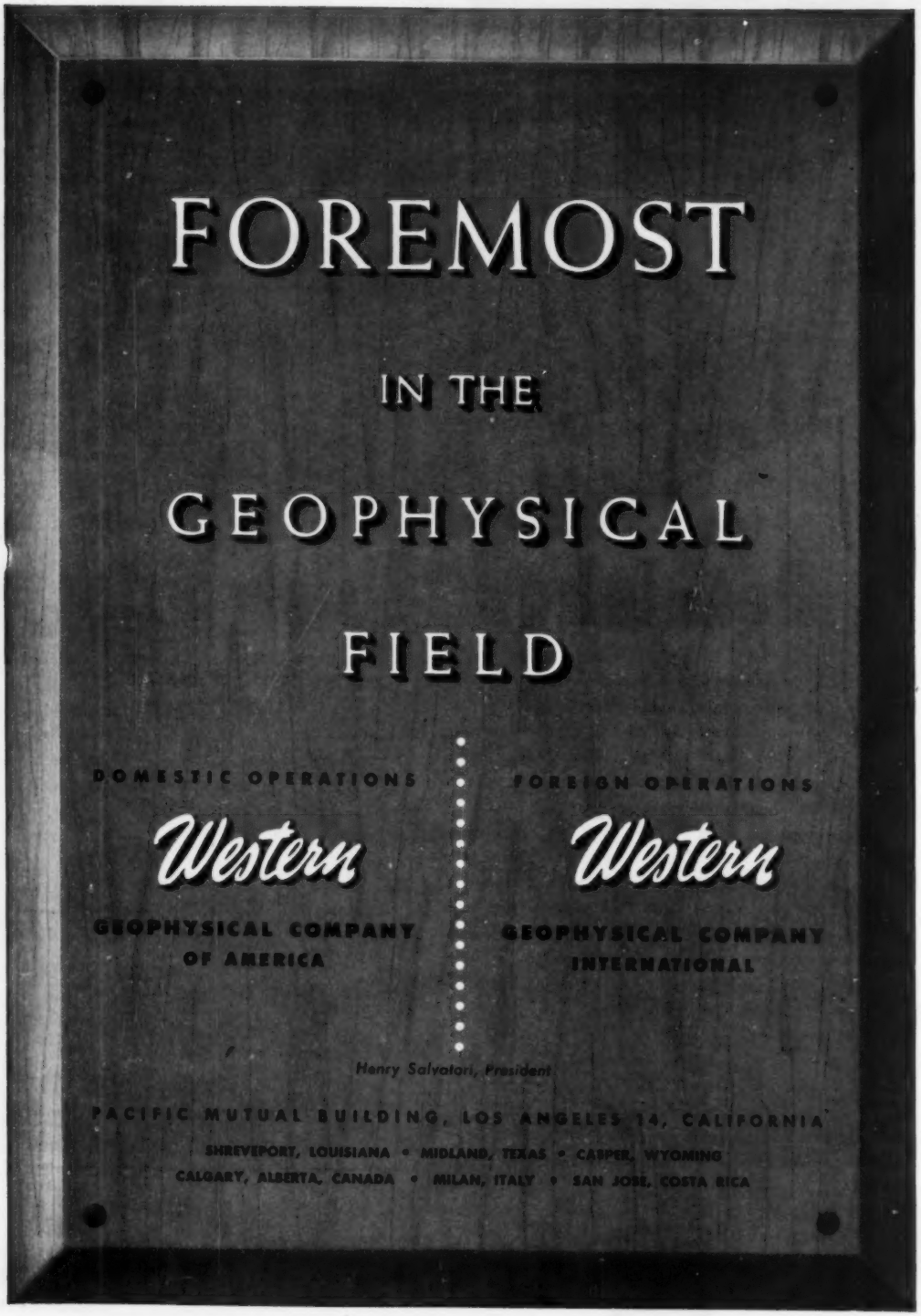
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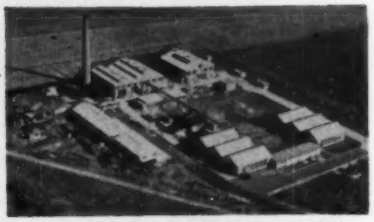

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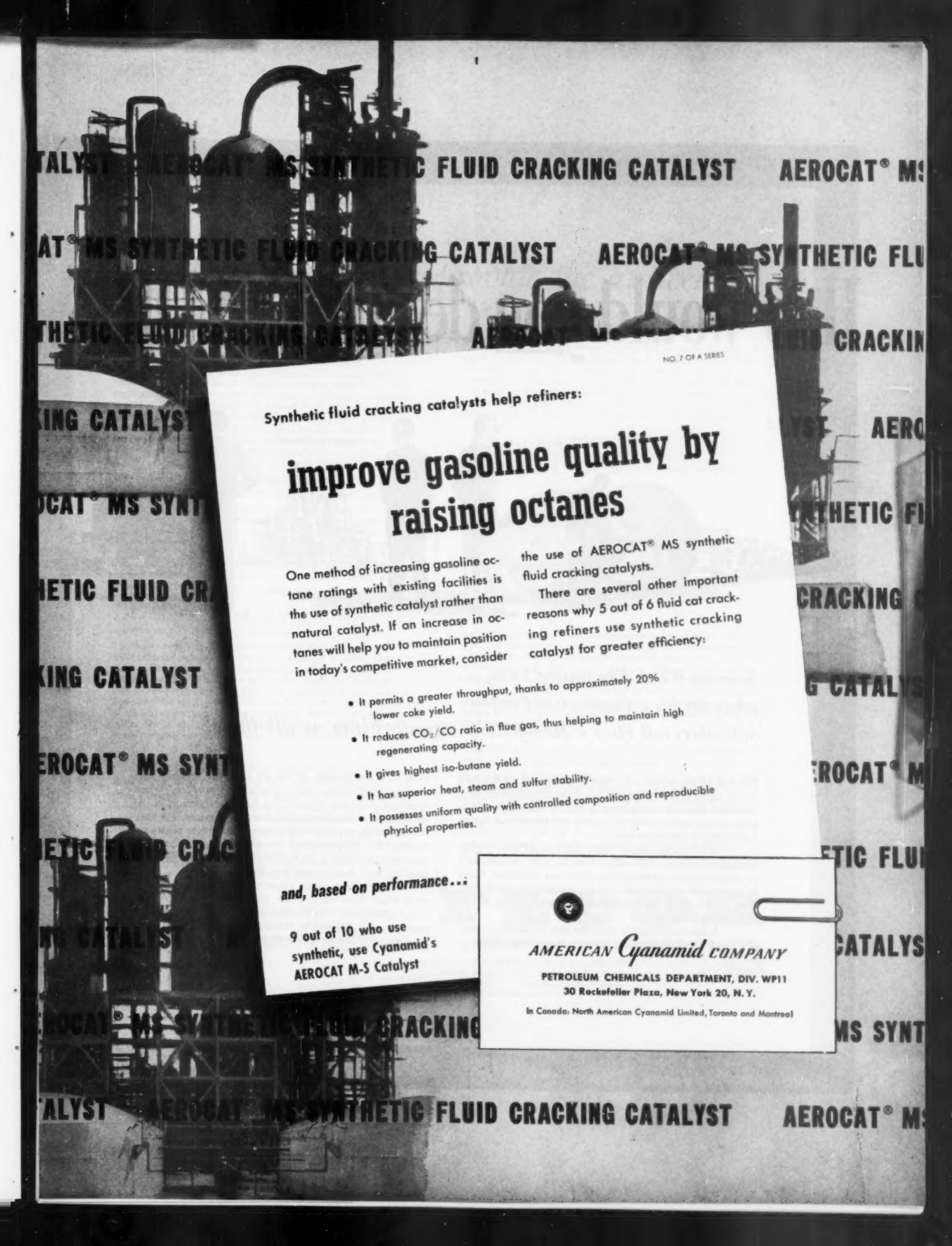


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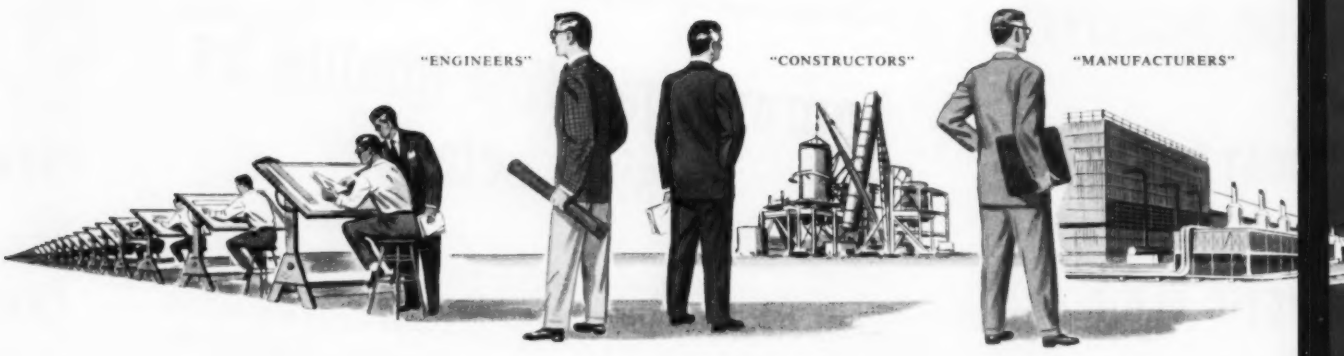


*Some say it's an Engineering Firm,*
*others say it's a Construction Company.*
*Still others call Fluor a Manufacturer. Actually* ***Fluor is all three!***

Because of the breadth of Fluor's activities since the turn of the century, different people in different industries have identified Fluor as an engineering firm, a construction company, or a manufacturer of cooling and processing equipment. This is understandable.

It is because, where clients have used Fluor's highly specialized services *individually*—engineering, construction *or* manufacturing—satisfaction itself has identified Fluor as an expert in the particular service successfully performed. This can be good. But it can also be limiting to the industries which Fluor serves.

It can be limiting in the sense that the satisfied client of a *single* Fluor service may, through incomplete identification, miss the benefits of Fluor's *complete* service—engineering, construction *and* manufactured products. Whenever you plan new construction or the expansion of old, compare *all* of Fluor's qualifications and services. The abilities to design, engineer and construct complete plants and facilities for the petroleum, chemical and other heavy industries—anywhere in the world—on time and within appropriation, have been proved time and time again.

These facts about Fluor give the complete story of what Fluor does—what Fluor has to offer *you*. More detailed information may be obtained from your nearest Fluor representative. He will be pleased to cooperate in any way possible. You can be *sure* with Fluor!

# *These Fluor Facts provide the answer*

A MANAGEMENT KNOWN FOR ITS EFFICIENT ORGANIZATION
*—of Fluor—of your project within Fluor*

The ability to organize in the face of constantly changing conditions accounts for Fluor's steady growth into recognition as a major engineering and construction firm. Good organization is demonstrated in the pride and teamwork evident throughout Fluor—in the handling of client's projects within Fluor. Each project has its own unit job organization under *one* project manager. He draws upon the many technical groups which make up Fluor and is responsible for your project—from beginning to completion.

A RESEARCH AND DEVELOPMENT DIVISION—
*for the study of problems—the development of ideas*

Fluor's Research and Development Division is staffed with technically educated and thoroughly experienced chemical engineers, chemists, physicists, and mechanical engineers, specializing in fundamentals and problems relating to the gas and petroleum processing industries and phases of the petrochemical and chemical industries. These personnel and facilities are available at all times to Fluor's engineering groups for the study of unusual problems and the development of new ideas.

A PURCHASING GROUP–AN ACCOUNTING GROUP–
*wide in scope—flexible in operation.*

These two highly specialized departments play a vital role in the successful and satisfactory completion of Fluor projects. They are geared to coordinate both inter-departmentally and with the established procedures of customer and vendor companies. Their services include the purchasing, inspection and expediting of materials and equipment for job sites anywhere in the world, and the establishment of efficient accounting systems according to individual client requirements. Broad experience is evidenced—material and equipment is being currently purchased at the rate of over $5,000,000 a month!

A LARGE RESERVOIR OF ENGINEERING TALENTS—
*with broad, diversified experience—modern facilities*

Fluor's Engineering Division is permanently staffed with over 800 chemical, process, mechanical, electrical, instrument, civil, architectural and hydraulic engineers and draftsmen. Headquartered in Los Angeles and Houston in modern buildings designed specifically for the expeditious handling of a large variety of engineering services, the broad and diversified experience of these groups embraces all types of projects—from the smallest unit to the largest—in natural gas, petroleum, petrochemical and industrial fields.

AN EXPERIENCED CONSTRUCTION ORGANIZATION—
*skilled in all crafts—world-wide in reputation*

Working in parallel and complementing the skills of Fluor's engineering groups, the Construction Division is permanently staffed with over 250 key men who are experienced in the construction of plants and facilities both in and out of the continental United States. This policy assures the availability of competent men for every project and enables Fluor to retain a closely knit organization which may be expanded around a nucleus built up over a period of years. The soundness of the policy is evident in the high degree of loyalty by these men for the interests of both Fluor and its clients.

A MANUFACTURED PRODUCTS DIVISION—
*an independent division—complete within itself*

Fluor's Manufactured Products Division is a large, completely integrated organization devoted exclusively to the design, development and manufacture of natural draft and induced draft cooling towers, air-cooled heat exchangers, pulsation dampeners, mufflers, gas cleaners, and other special products. This division functions independently, with modern facilities strategically located on the West Coast and in the center of the United States. The highly specialized products manufactured by this division are recognized throughout the world for sound engineering, quality construction and guaranteed performance.

STRATEGICALLY LOCATED SALES AND SERVICE OFFICES—
*close client contact—the ability to serve*

Fluor's Sales and Service offices are so located and so staffed that continuing sales and technical contact can be maintained to meet customer requirements anywhere in the world. Fluor representatives are technical men with technical experience. They are qualified to give detailed information—to make decisions. These things are important when evaluating the abilities of a contractor to successfully perform difficult and complex projects involving engineering, construction and/or the supplying of special products.

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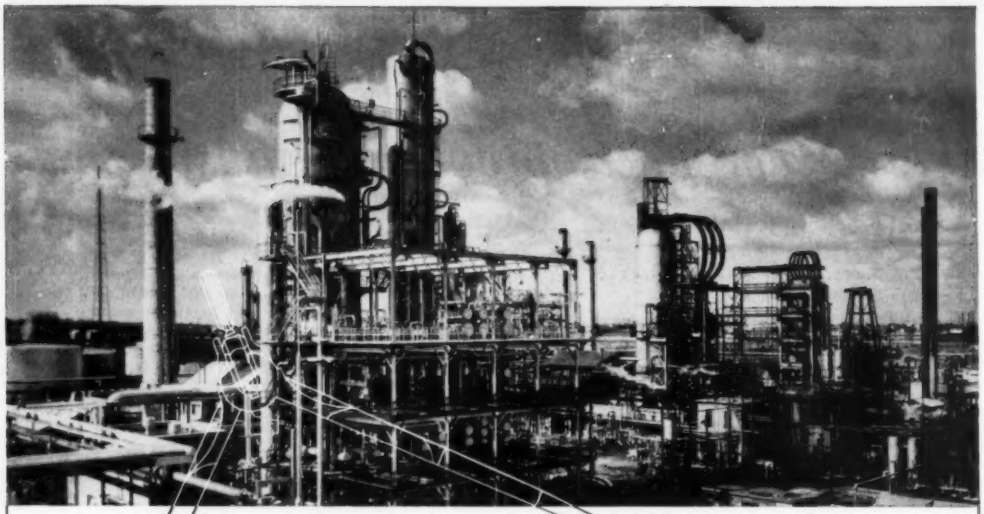

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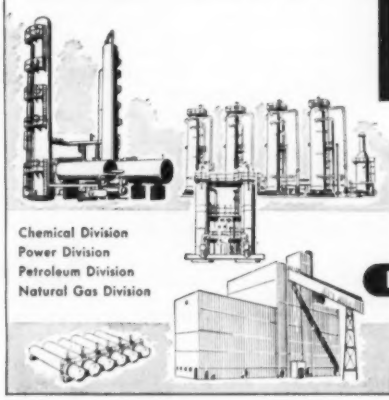

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# THREE HOURS *and 55 MINUTES*

**That's all it took to locate the stuck point at 10,600 feet and back-off with McCullough Magna-Tector and String Shot.**

***McCullough Back-Off Service Is Fast***

**1**

All free pipe can be removed from the well before it has a chance to stick further up the hole. A common occurrence if action is not taken immediately. The McCullough Magna-Tector and String Shot locate the lowest free point and loosen all free pipe in a matter of hours compared to the days needed by other methods. For example: Drill pipe was stuck at 10,600 feet. The Magna-Tector located the stuck point just above the drill collars. A String Shot loosened the first joint above the stuck point and pipe was recovered without damage. Total time was three hours and 55 minutes.

***All Free Pipe Recovered In Two Easy Steps***

**2**

First, the Magna-Tector locates the stuck point—within inches—within minutes. Second, the String Shot loosens the first joint above the stuck point. All free pipe is recovered at one time. For example: An operator estimated the stuck point of his drill pipe to be at about 4200 feet. However, the Magna-Tector located the stuck point at 5362 feet. The String Shot loosened the first free joint at 5350 feet. All free pipe was recovered at one time. Actually, the operator received a bonus of 1150 feet of pipe he didn't expect to recover so easily and subsequent fishing operations were simplified and speeded.

***Magna-Tector Saves Fishing Jobs***

**3**

The Magna-Tector not only locates the stuck point in drill pipe, casing, or tubing, but many times indicates the sticking medium, and in some cases working and/or spotting oil in the tight place indicated by the Magna-Tector, has freed the pipe. This is a fairly common occurrence and has eliminated many fishing jobs. For example: Drill pipe was stuck at 8340 feet. The Magna-Tector located the stuck point at 6540 feet. However, the Magna-Tector indicated that the pipe was frictionally held by compacted shale or sand. Working the drill pipe loosened the string, freeing it deeper and deeper down the well until all the drill pipe was free. The Magna-Tector and immediate action saved the operator many hundreds of dollars.

***Unusual Jobs Accomplished***

**4**

The McCullough Magna-Tector and String Shot save the operator untold hours of rig time because of their ability to perform the tough, unusual jobs. Jobs such as back-off operations through the restricted I. D. of fishing tools, production packers, etc.—operations in high angle holes—operations under excessive pressure and temperature—and many others. For example: An operator's tubing was stuck in 7" casing. The Magna-Tector revealed that the packer was stuck. A fifteen foot String Shot, 200 grains of explosive per foot, was placed through the body of the packer and detonated. Packer came loose immediately. There was no damage to tubing or packer.

***No Substitute For Experience***

**5**

Over 10,000 jobs, successfully completed, make up McCullough's backlog of experience in back-off operations. Our equipment is the most efficient and dependable available. Our Servicemen have wider experience in back-off operations than any other group of men in the oil industry. They are specialists—specialists in getting pipe out of the hole in the fastest possible time at the least possible cost—specialists in saving time, money, and pipe.

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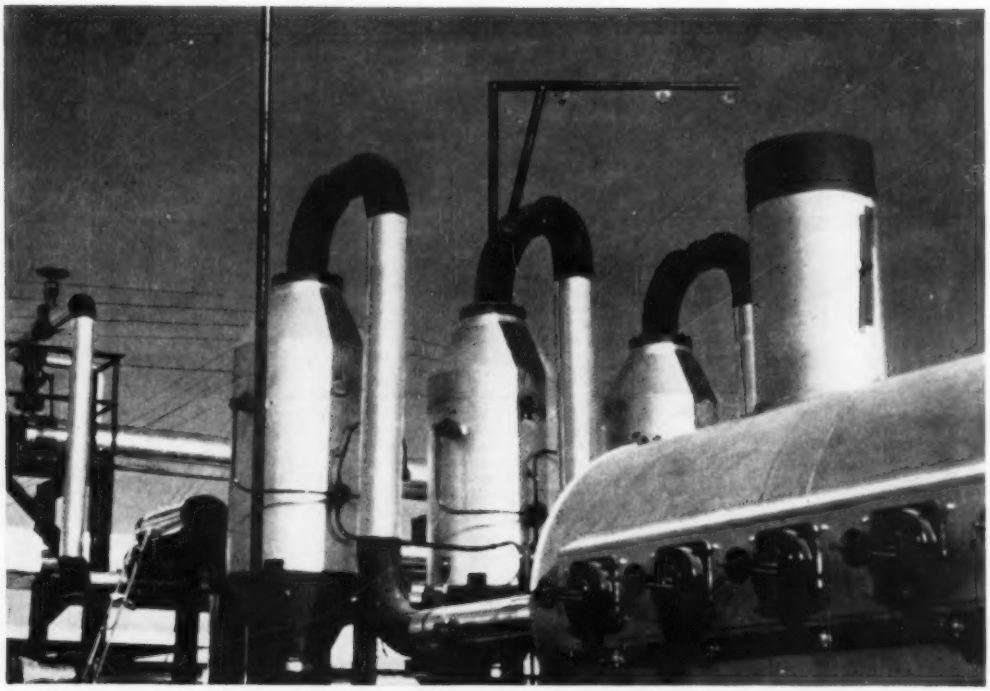
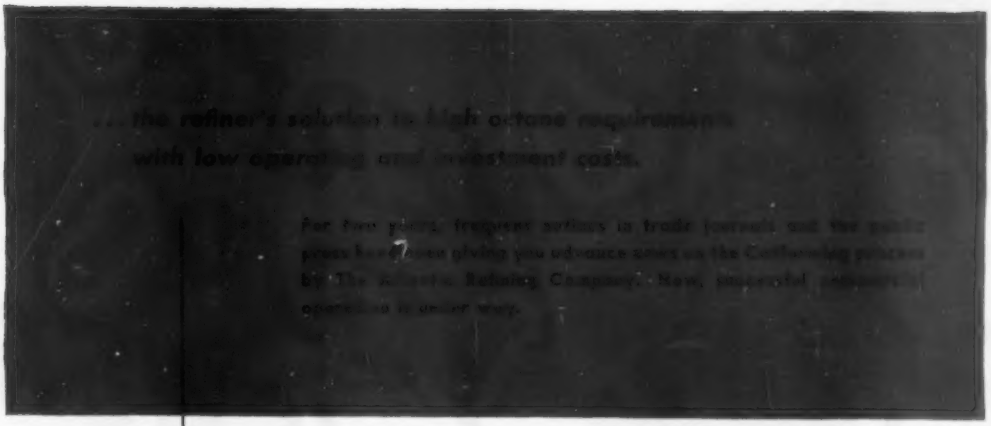
# CATFORMING...

## the Atlantic catalytic reforming process



McBride Refining's Catforming unit at La Blanca, Texas



## it's the catalyst that counts

Since catalytic reforming was first utilized, numerous processes have been introduced to increase its benefits. None of these completely satisfied our requirements. So we looked for the answer in the catalyst itself.

## years of research

Years of continuous laboratory study were devoted to the problem . . . in a search for a new catalyst with superior qualities. This extensive research paid off in a completely new catalyst which is the heart of Catforming. This catalyst combines improved selectivity, greater stability, excellent resistance to poisoning, and ease of regeneration.

## now in commercial operation

Catforming is now in successful commercial operation. It is giving exceptional results. Our engineers are ready to give you the whole story. Call or write The Atlantic Refining Company, Research and Development Dept., P. O. Box 8138, Philadelphia 1, Pa. (Telephone, HOward 5-2345).

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VOL. 23 NO. 12
NOVEMBER 1952

# World Petroleum

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## THIS MONTH'S COVER

The Trapp field near Susnak, Kansas is in the heart of the wheat belt. David M. Santee, who was commissioned by the Carter Oil Co. to paint the scene, has caught the feeling of prosperity of the area resulting from the surface crop of wheat and the rich harvest of black gold gathered from below.

Mr. Santee is a native of Indian Territory who has had only one year of formal art training at the University of Oklahoma. He has been doing free-lance work, specializing in industrial scenes, and makes his home in Tulsa.

Color plates originally were published in a Carter Oil Co. *Report to Employees*, and are reproduced here through the courtesy of Condon Mackay, Carter's director of public relations.

WHAT MAKES A TRADEMARK GREAT?
The "Flying H" has flown wherever free men drill for oil. But an adopted symbol of identification has no honor in itself. Greatness comes when the company it marks has earned a place of high esteem.
For over a quarter century, on more than a million jobs, Halliburton has strenuously strived to give the highest quality service. When the "Flying H" is looked upon as a symbol of service, the men of Halliburton will have earned a cherished honor.
HALLIBURTON
OIL WELL CEMENTING CO.
DUNCAN, OKLAHOMA

# A CHALLENGE WELL MET

By Frank M. Porter *President, American Petroleum Institute*

THE oil industry's current expansion program is a dramatic panorama of free enterprise at work. It is compelling proof of what free men and free capital can do when supply and demand are the taskmasters, and the competitive instincts of a dynamic industry are neither thwarted nor dulled by inhibitions or prohibitions.

The current program had its genesis in the post-war days of World War II. Civilian demand, which had been suppressed or by-passed by military necessity, surged forth like a tidal wave after V-J day. Consumption skyrocketed dizzily, and production spiraled upward too in a corresponding sweep. The seemingly insatiable appetite for more and more oil and oil products kept the petroleum industry operating in record-breaking fashion.

From the very beginning, the industry met the consumption challenge head-on. It launched the biggest building program in petroleum's history. All along the line, operations were accelerated constantly and were modernized or expanded as fast as men, materials and money could make it possible.

In the seven-year period since the end of World War II, the domestic oil industry has poured more than 19 billion dollars into this vast program. For the current year alone, it has scheduled more than four billion dollars for expansion and development. Included in this total is an allotment of 464 million dollars for operations overseas.

The significant factor, over and above the immensity of the figures themselves, however, is this: The domestic oil industry has managed the bulk of this great financing from its own earnings. In 1951, for example, 60 cents out of every dollar of net income was plowed back into the business. That is an excellent example of capital enterprise's way of doing things—of building constantly for today and tomorrow. But it should be noted here too, that petroleum's tax burden is becoming so heavy that our freedom to use the money generated in our own industry is being curtailed and jeopardized.

Earlier this year, the Institute made an unofficial survey of the industry's 1952 program. Because it was by far the biggest one-year spending program in oil history, perhaps a recapitulation is in order to illustrate its magnitude and provide an indication of where the money is going.

More than one and one-half billion dollars were earmarked for wells and equipment. This was an increase of 200 million dollars over 1951.

Expenditures to build new refineries, construct new units and modernize existing facilities were estimated at 566 million dollars. This is more than twice the amount spent in 1951 in this division.

Other important building plans were indicated in the funds allotted for tanker construction. For example, more than 104 million dollars were to be spent for this purpose in 1952—nearly four times the amount spent last year. Other forms of transportation increased the projected expenditures for this phase of petroleum operations to more than a half-billion dollars.

Marketing plans called for the spending of nearly 289 million dollars—an increase of eight per cent. Capital expenditures for fertilizer and chemical plants in 1951 and 1952 were expected to top 91 million dollars. This is almost as much as was spent during the preceding five-year period.

All things considered, the 1952 total represents an increase of 25 per cent over last year's three billion, 270 million dollars. At that, the 1952 total is probably on the low side because the API survey included only a conservative estimate for the thousands of independent operators on whom little or no actual information is available.

Probably no other industry in history has spent, or scheduled the spending, of so much in so short a period of time. But that is oil's way of doing things. It is an industry whose horizons are as unbounded as the universe.

How much effect the steel dispute will have ultimately on the expansion program is still problematical. It is too early to gauge that, but there is no doubt that it has forced some revisions already and and slowed down the schedule somewhat.

Some refinery capacity which was expected to have been completed during the latter part of this year will not be ready for operation until 1953. Pipe line construction and the building of additional steel storage also has been delayed.

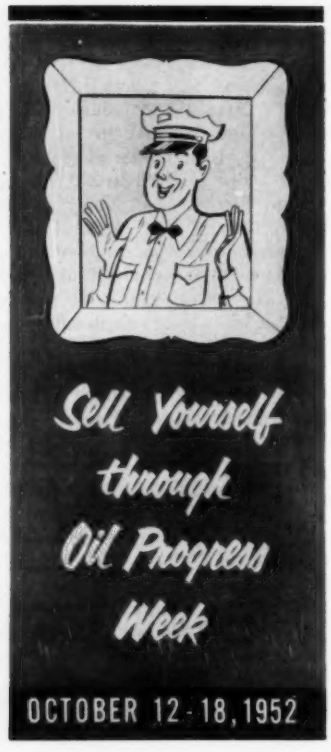
Drilling operations were slowed from the high rate of the early part of this year, but even so, completions during the year of 1952 will probably be greater than in 1951.

51° BELOW ZERO
Petroleum Research Helps Make Arctic Defense Possible
New Jersey Turnpike Tests Prove
Motorists Now Get 50% Better Gasoline
Atomic Tests Prove
New Motor Oils
Can Triple Car Engine Life

# Public relations program makes headway

*Above: Charles Z. Hardwick, vice president of The Ohio Oil Co., 1952 national chairman of the Oil Industry Information Committee.*

*Below is Stanton K. Smith, president of Smith Oil & Refining Co., Rockford, Ill., who will head the program in 1953.*

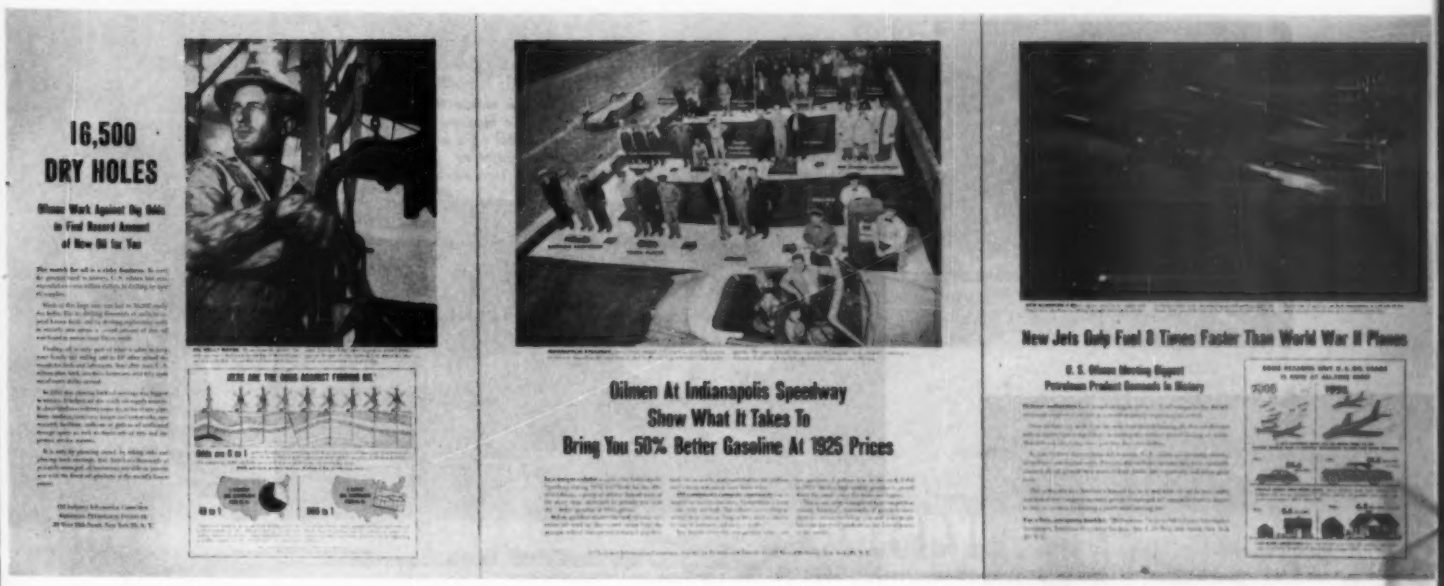



THE ROUGH ROAD traveled by the Oil Industry Information Committee since its inception five years ago is getting smoother. Its double-barreled campaign to promote understanding and good will for the oil industry and the American system of free enterprise is making headway consistently and continuously.

This year's observance of Oil Progress Week, the climax of the committee's year-round public relations efforts, was by far the biggest and best of the series to date. There were more speeches, more radio and television shows, more special events and other activities than ever before. It is, of course, virtually impossible to gauge the public impact of all these activities, but with so many of them going on all over the country there should be no reason to doubt that the objectives of the program were advanced considerably.

This year's observance was built around the cryptic phrase "2 Equals 3." An outgrowth of the experiments and road tests conducted by Ethyl Corporation on behalf of the industry, the "2 Equals 3" theme symbolized the progress made in gasoline quality alone over the last 25 years—that two gallons of modern gasoline will provide the same work-energy that required three gallons a quarter of a century ago.

One of the many tools that the volunteer oil men used to tell that story of gasoline progress was a new motion picture entitled


16,500
DRY HOLES
Oilmen At Indianapolis Speedway
Show What It Takes To
Bring You 50% Better Gasoline At 1925 Prices
New Jets Only Fuel 8 Times Faster Than World War II Planes

*General advertising this year has stressed accomplishments of the petroleum industry in the fields of production and research to improve products.*

*One of the two movies of the year has stressed the economies enjoyed by motorists as a result of motor and fuel improvements.*

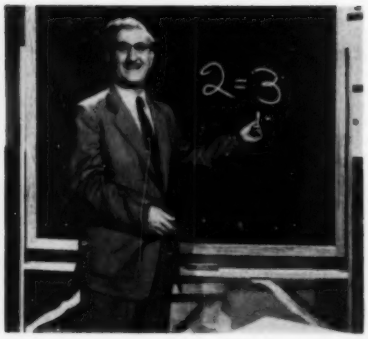
"2 Equals 3." This featured Dr. Roy K. Marshall, of science and television fame, in a laboratory demonstration of how and why modern gasolines are superior in quality and energy output.

Another motion picture which was viewed by tens of thousands of persons during Oil Progress Week was "Crossroads, U.S.A." This was the committee's major motion picture effort. Produced in the studios of Columbia Pictures Corp., it had an all-Hollywood cast including such well-known personalities as Regis Toomey, Rhys Williams and Elisabeth Risdon.

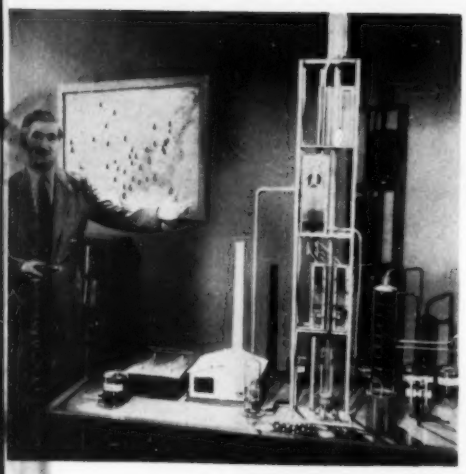
With a suburban service station as the main theater of action, the motion picture provided its audiences with specific illustrations of how competition and free enterprise have made America the land of opportunity. Drama, suspense, action and the story of oil were interwoven in a fast-moving plot built around a disillusioned young man's "crossroads" decision at a crossroads service station.

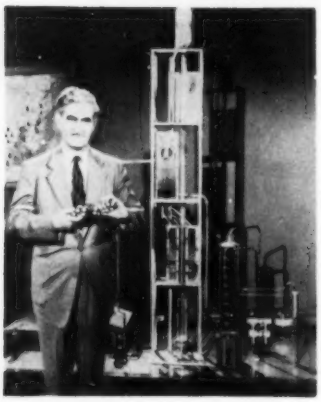
Of the many special events staged during Oil Progress Week, one of the most significant was the dedication of a granite memorial to the late W. A. "Uncle Billy" Smith, the driller who helped Col. Edwin L. Drake bring in the nation's first commercial oil well in 1859.

This took place at Hannahstown cemetery, near Tarentum, Pa., where Smith's remains were interred in an unmarked




*A group of stills from the film "2 = 3." In the movie the equation is explained by a demonstration of the modern cat cracker which is shown by a model. A model of a modern motor is also used to explain developments in the automotive industry which has been a partner in making two equal three.*





grave years ago. More than 15,000 persons turned out for the ceremony. Among the speakers who paid tribute to Smith were Secretary of the Interior Oscar Chapman, who made the principal address, and Frank M. Porter, president of the American Petroleum Institute.

Probably the biggest Oil Progress Week event was the Permian Basin Oil Show at Odessa, in the heart of the famed West Texas oil fields. This was in the form of a three-day exposition, and the sponsors proclaimed in advance that it would draw more than 100,000 persons.

Although Oil Progress Week overshadows everything else that is done by the Oil Industry Information Committee, a "down-the-line" comparison of key statistics shows the program is making big strides in organization and effectiveness.

During the first eight months of 1952, for example, there were 1,707 local committee meetings. These were attended by 31,736 persons. During the same period of 1951, there were 1,476 meetings, attended by 20,465 persons. The increase in 1952 meetings is an obvious reflection of expanded participation and activity by local oil men.

Externally, oil men made 2,651 speeches to an aggregate audience of 273,699 persons during the first eight months of 1952; comparably, for the same period of 1951, there were 2,024 speeches and an audience of 184,437 persons.

During the first eight months of 1952, O.I.I.C. motion pictures were shown 6,068 times to a total audience of 627,254 persons; similarly, oil company motion pictures were shown 68,998 times to an audience of 7,894,278 persons. Combined, these total 75,066 showings and an aggregate audience of 8,521,532 persons. A comparable breakdown for 1951 is not available, but the combined statistics show 57,595 O.I.I.C. and company motion picture showings and a total audience of 8,673,540 persons.

The number of exhibits tripled during the first eight months of the current year, and the amount of radio-television time doubled during the same period. Carrying out these activities is a small army of volunteer oil men whose ranks are swelling constantly. There are more than 20,000 persons affiliated with the program now, and when a new count is made shortly after the first of the year, the number is expected to show a substantial increase.

Though their work takes scores of forms through hundreds of channels, their central objective is the same: that the individual interests of the American people are best served by private management and competition.

How successful is the O.I.I.C. in telling its story of progress and competition?

Last year it tallied 2,274 meetings, 7,058 speeches to 700,000 persons; 746 motion picture prints in circulation; 3,470 radio programs; 369 television shows; 10,036 copies of an industry display placed and shown; 109 magazine and syndicated press articles; 8,128 news stories, 930 editorials and 2,260 pictures during Oil Progress Week alone; 16,390 clippings of oil industry stories; 189 advertisements in national magazines with a total circulation of 60 million; 3,152 billboards; and more than 10 million pieces of distributed printed material.

National Chairman of the Oil Industry Information Committee for the current year is Charles Z. Hardwick, vice president and a director of The Ohio Oil Company, Findlay, O. He will be succeeded on January 1 by Stanton K. Smith, president of Smith Oil & Refining Co., Rockford, Ill.

# STANDARDIZATION

*Vast sums have been saved by the international petroleum industry during the 28-year history of the standardization program of the API Division of Production.*

TODAY IT IS POSSIBLE for an oil operator to purchase component parts of a drilling rig from manufacturers located in 15 different countries, assemble the parts in any country, and all the parts will interchange and perform satisfactorily.

This near miracle of interchangeability didn't just happen. It was brought about only after a great deal of planning and pioneering on the part of far-sighted members of the industry.

During the early 1920s, complete chaos surrounded the interchangeability of important drilling tool connections sold by various manufacturers in this country. Use of certain threaded connections on accessory equipment in the drill stem, such as tool joints, drill collars and tool bits, was made difficult, if not altogether impossible, unless the connecting parts happened to have been made by one manufacturer. Obviously, many lengthy and costly delays were imposed upon the production branch of the industry due to the endless confusion over drilling equipment.

The record shows that this seemingly unsolvable problem came in for its share of discussion at the very first annual meeting of the American Petroleum Institute in 1920. Then, at the annual meeting in 1923, the API Board of Directors, by resolution, authorized the appointment of several committees to work out an approach aimed at solving the problem.

In May, 1924, the Institute followed up the work of these committees by retaining the services of a young man who had been an executive with an equipment manufacturer. He was appointed director of the Division of Standardization which was later to become the API Division of Production. He was Carl A. Young, who today is the director of the Division of Production, and who has played a major role in guiding the Institute's standardization program over the last 28 years.

In 1925 the Central Committee on Standardization of Oil Field Equipment was organized to govern all activities of the program. The late J. Edgar Pew, who was vice president of the Sun Oil Company, was the first chairman of the committee. He served in this important post until 1946 when he was replaced by the present chairman, John R. Suman, vice president of the Standard Oil Company (New Jersey), who has been extremely active in the work of the committee since its inception.

When the central committee was set up, the Institute directed that its work be concerned with the preparation and publication of specifications and recommended practices on all major items of equipment used in oil production. The general objectives were: (1) simplification of sizes, grades and designs, (2) standardization of dimensions which affect interchangeability, (3) stabilization and improvement of quality, and (4) development of economical practices for care and use of equipment.

How efficiently the committee has functioned since 1925 and how successful it has been in achieving its broad objectives can be readily seen from the fact that now drilling parts can be ordered from many fabricators in any of a number of countries and the parts will perform in conjunction with one another as though they had been turned out on a single assembly line. The work of the committee has been international in scope and character.

A number of petroleum industry leaders have remarked that even if the API had accomplished nothing else other than the adoption of drill tool standards and specifications, it would have been a wonderful and far-reaching work, resulting as it has, in the savings of millions of dollars to the industry.

It is difficult to calculate accurately the savings to the industry of the API standardization program. However, it has been estimated that standardization effects a savings of more than 50 million dollars each year. It is of interest to note that the value of products made annually to API standards is on the order of half a billion dollars, not taking into account materials manufactured and distributed abroad.

Every year, standardized equipment saves countless man hours of labor in drilling operations. This efficiency makes itself felt by both speeding up and increasing production of crude oil. Standardization, then, has through the years exerted a direct and an important influence on the capabilities of the industry to find and produce ever-increasing supplies of oil. The government has acknowledged the value of API specifications. It made them mandatory during the critical years of World War II when oil was fueling the Allies along the road to victory.

In 1928, when the standardization program had been in operation for only five years, W. G. Skelly of the Skelly Oil Company spotlighted its contributions to the industry and urged its widespread acceptance in an address delivered before the API ninth annual meeting.

"Proper standardization will result in reducing our investments in inventory of materials, both to the operators and the manufacturers," Mr. Skelly said. One operator reported that he had over 50,000 different kinds of material in his warehouses due to the variety of sizes and brands in general use.

Mr. Skelly cited the following typical reductions in inventory made possible through API standardization in its first five years:

Cable Drilling Tool Joints: before standardization, 306; reduced to 11 API sizes.

Derricks: before standardization, over 200 different sizes; reduced to 11 API sizes.

Rotary Drilling Taper Joints: before standardization, over 200 different sizes; reduced to seven API sizes.

"What does all this mean to us as executives?" Mr. Skelly asked. "It means that instead of installing and paying for large departments in our own organizations to prepare our own specifications, we can secure them through the Institute at a very nominal sum. It means that we will receive an article under a better specification than any single company could prepare because it would be practically impossible for any single company to find in its own organization the wide practical experience and technical advice necessary to properly prepare a national specification. On the question of master gages alone, which is the fundamental cornerstone of any progressive standardization program, an important official of the Bureau of Standards stated that the Institute has accomplished more in the last two years than any other industry has done in twenty.

"Another important accomplishment deserving mention," Mr. Skelly continued, "are the codes on the proper care and use of equipment issued by the standardization committees. They were not content to formulate specifications alone, but have prepared minute instructions on correct methods for the care and use of materials in the field, to the end that the greatest possible value can be secured from our material purchases. The Institute has also prepared posters giving condensed rules on the proper care and use of equipment, which should be posted in every field office, warehouse or bunkhouse where the men usually congregate. We could do no greater service to ourselves than to put a copy of these codes and posters in the hands of every foreman, driller and tool dresser in the field. We owe it to the small operator, who usually follows the practice of the larger operator, and who lacks all of these technical and practical facilities, to make them available to him by endorsing, through actual usage, these API standards."

Today there are 487 manufacturers in the United States and 133 manufacturers outside this country who have been licensed to stamp the API monogram on their drilling equipment. The monogram appearing on a product means that it measures up to certain rigid API specifications.

In the U. S., the state of California leads with 117 licensees. The first five states include Pennsylvania, 63; Texas, 61; Ohio, 47; and Oklahoma, 37.

On a world-wide basis, England has 39 licensed manufacturers; Germany, 28; Canada, 26; France, 12; Italy, 11; Japan, 4; Austria, 2; Belgium, 2; Holland, 2; Scotland, 2; Australia, 2; Sweden, 1; Switzerland, 1; and the Dutch East Indies, 1.

A large number of API specifications are translated into German, French and Italian. In English-speaking countries, API specifications have been adopted by several of the national standards agencies or have been used as the basis for the promulgation of related standards in which the interchangeability provisions of API specifications have been preserved. Cooperation with foreign national standards organizations is maintained through the exchange of committee reports, specifications and various publications.

The primary factor in world recognition and acceptance of API standards has been the leadership demonstrated by the American oil industry in the development of drilling and production methods and in the application of those methods in foreign fields.

The wide distribution of American equipment abroad for years carried with it API standards. Eventually many foreign manufacturers became interested in utilizing American designs, which, of course, involved the use of the necessary master gages on threaded equipment. This brought with it the problem of testing and maintaining foreign master gages. The problem was solved through the appointment of foreign official certifying agencies which are the counterparts of the U. S. Bureau of Standards.

*The Late J. Edgar Pew, the father of A.P.I. standardization, who headed the central committee in charge of this activity for 21 years.*

*Carl A. Young organized the A.P.I. division of standardization in 1924 and became secretary of the production division in 1930.*

Before appointment, the foreign testing agency was required to calibrate a gage and report on its accuracy. The gage was then sent to the Bureau of Standards where it was again calibrated, and the results of the two tests were compared. Any differences were adjusted until there was complete agreement on the accuracy of the equipment and methods of measurement used by both bureaus. The U. S. Bureau of Standards has always had the final word in matters relating to accuracy, and the oil industry is deeply appreciative of the bureau's fine cooperation.

This method of interchange testing solved the question of testing gages owned by foreign manufacturers. Adjustment of differences with the official English laboratory were minor and quickly solved. In other countries, the period of interchange testing was longer. In one instance, the U. S. Bureau of Standards supplied the foreign testing agency with drawings of

equipment that had to be built before the bureau could accept its measurements.

Today there are four foreign testing agencies outside the United States. They are: National Physical Laboratory, Teddington, Middlesex, England; Physikalisch-Technische Bundesanstalt, Braunschweig, (West) Germany; Laboratorie d'Essais du Conservatoire des Arts et Metiers, Paris, France; and National Standards Laboratory, Division of Metrology, Chippendale, New South Wales, Australia.

Because of the present strategic and economic importance of petroleum, worldwide drilling and production is proceeding at a tremendous rate. This intensity is reflected in a current widespread participation in API standards and specifications.

Not long ago there was striking evidence of the value of the API program, resulting from a shortage of steel in this country. Several thousand tons of tubular goods made in England, Germany, Belgium and France were imported into the United States and were used in domestic drilling operations. The foreign pipe interchanged perfectly with the American product, and no time was lost in maintaining our record drilling and production.

The key to maintaining interchangeability of drilling tools is the strict maintenance of accuracy of reference master gages owned by the various manufacturers. This factor was achieved originally under the tutelage and guidance of the Bureau of Standards. The keystone of the arch was a set of grand master drilling tool gages deposited with the bureau. Supplementary secondary masters were deposited with official testing agencies in the Eastern, Mid-Continent and Pacific Coast regions where manufacturers could test their master gages at stated intervals. When gages get beyond stated interchange tolerances they are reconditioned so that no manufacturer can depart from the official standard for any length of time. Experience has shown that the interval of three years now specified for re-testing insures complete protection for maintaining the API standards.

In the case of pipe threads, interchangeability is maintained by direct measurement of the threaded elements of the manufacturers' reference gages. Annual reports from pipe manufacturers are required on the accuracy of their master gages. It can now be said that every important threaded connection in use in the producing branch of the industry has been standardized.

A system of reports on gages owned by manufacturers has been adopted, and pedigree records are maintained in the API Division of Production offices in Dallas, Texas, concerning the accuracy of master gages owned by each manufacturer authorized to use the API monogram. It is through this smooth-functioning system of master gages, official testing agencies and systematic reports that interchangeability is provided on an international basis.

It should be pointed out that use of the API monogram is not confined solely to threaded connections. It is authorized for use on such diverse items as wire rope, derricks, mating pump parts, belting, steel chain and others.

In this connection, the Central Committee on Standardization includes 11 major topical committees each of which is responsible for specifications and recommended practices in its specific field. Items covered range in size from ¾ inch sucker rods and 1¾ inch working barrel cups up to steel tanks for oil storage of around 300,000 barrel capacity.

Fields covered by specifications and recommended practices include: belting, boilers, cable drilling equipment, derricks and masts, tubular goods, valves and fittings, rotary drilling equipment, wire rope, oil well cement, production equipment and tanks for oil storage.

The work of the topical committees is thorough and exacting. It is interesting to note that at an early date the storage tank committee had completed specifications for riveted steel tanks ranging in capacity from a few thousand barrels to approximately 150,000 barrels. The specifications describe the chemical and physical properties of the steel used in constructing the tanks, standard size of plates, an order form for purchasing, and complete fabrication and erection specifications, including complete drawings of every detail necessary for tank construction (56 in all), and including even the size and number of rivets required for each size tank. These specifications have now been superseded by a new code covering all-welded tanks.

During World War II several thousand storage tanks made to API specifications were used by the armed services, and when the war was over there was a large surplus which was immediately made available to the industry. Interchangeability of component parts had been worked out with the U. S. Army so that storage tanks made for either the armed services or for commercial usage were identical. The savings realized in producing equipment of this type for defense needs without the necessity of building special plants and facilities have been great.

Through the years since 1920 when the question of standards and specifications was brought before the API, hundreds of oil men from all parts of the nation have given generously of their time and talents to help solve the once insurmountable problem. Space does not permit the mention of every oil man who labored loyally on API standardization and recommended practices committees, however, the character and merit of the work performed by several men during the earlier years must earn them special consideration.

The late J. F. Lucey, of Dallas, was an extremely active and valuable participant during the formulation of the API program. He worked closely in conjunction with R. L. Welch, the former general secretary of the Institute, and played a prominent part in developing the committee activities.

T. E. Swigart, president of the Shell Pipe Line Company, accomplished much to bring about standardization of pumping equipment and also served in other fields.

C. C. Scharpenberg, former chief engineer of the Standard Oil Company of California, was a pioneer in his work as chairman of the committee on wire rope from 1925 to 1938.

The extraordinary success of API standards and specifications and the boundless benefits they provide to the oil industry today represent a monument to the resolution and ability of these oil men, and many others like them.

*John R. Suman, vice president of Standard Oil Co. (N.J.), has headed the central committee on standardization since the retirement of Mr. Pew in 1946.*

*W. G. Skelly, president of Skelly Oil Co. and of the International Petroleum Exposition, was one of the early supporters of the standardization movement.*

*Walter S. Hallanan, left, chairman of the National Petroleum Council, and Oscar Chapman, Secretary of the Interior, to whom the NPC reports.*

# committee with GUTS

In seven years of expert advisory service to the United States Government, the National Petroleum Council has preserved its independence of action and opinion

**By Joseph Huttlinger**

WHEN THE KOREAN WAR broke out in June, 1950, promising an alarming increase in demand for petroleum, the government turned to the National Petroleum Council. Interior Secretary Oscar L. Chapman asked the council, his advisory group, to make studies and reports about the military demands ahead and the ability of the industry to meet them.

A few days later, four committees of the council were at work on the task. The studies covered military demands, the steel needs of oil and gas, oil transportation and storage capacity.

A few years back, when a postwar oil shortage was shaping up, the government turned to the council for help. Through a system of nationwide committees, the council helped find oil and get it to the spots where it was needed. There are oil men today who say that the council's work averted a serious shortage. All agree it helped beyond measure.

Let's take another example: Once a Congressman telephoned the council's Washington office to complain that an oil distributor in his state had been cut off from oil supplies of a major oil company in the middle of the winter. "I am told my people are going cold," he said. "What about it?"

The reply was, "I'll get the facts for you today."

Council headquarters contacted the president of the major oil company. A few hours later the report came back that the distributor was overselling and stealing customers at a time of emergency. The word was passed on to the Congressman.

"If that's the case, he'll get no help from me," the Congressman said. A potential attack on oil was stopped in its tracks.

The council has been giving this kind of service since it was created by Secretary of the Interior J. A. Krug under an executive order of President Truman. The council held its first meeting June 21, 1946 in the Interior Department.

In the organization, the government has regular and frequent access to advice of top executives who earn in the aggregate $5 million a year in salaries alone. The talent, of course, could not be bought. If the government were to pay the salaries for the time on council business, the bill would come to $250,000 a year. Over a seven-year period, it would approach $2 million. When the time of oil company staff men, working on committees, is figured in, the amount is doubled. Over and beyond that, the council comes up with $85,000 a year for secretarial and other council expenses, shared by members depending upon size. A few members pay nothing, several pay $100 a year, some

big oil companies pay $3,000, and the peak goes to $4,500. Add to that the expenses of travel to and from Washington for the four annual meetings, and the total outlay of council members over the years may come close to $5 million. Some say $10 million is more accurate.

The bare statistics on the work of the council are impressive. Thus, over the years, the group has been asked to make 73 studies, many of them major ones. The council agreed to make 61, and found 12 of them outside its authority. A total of well over 100 reports, including interim ones, resulted. In all, 921 different persons have served on committees of the council, but only 179 of them, the cumulative total of persons who have served on the council, were council members. The rest were oil men, generally in companies of council members. Since some persons have been on ten or more committees, the total appointments to committees comes to about 2,500, almost exactly half of them nonmembers of the council.

The makeup of the council shows, as might be expected with key men in the world's greatest industry, a number of persons of considerable wealth. Some say that at least 30 of the 101 members are worth one or more million dollars. By and large these men earned their money. A typical example is W. Alton Jones, President of Cities Service Oil Co. He started work at an early age in Missouri, where he was born, beginning as a school janitor. A large number of members of the council are relatively poor men. Some have total incomes of less than $10,000 a year.

Members include the presidents or other executives of about 20 large oil companies, six natural gas companies, 25 oil and gas trade associations, individual crude oil producers, refiners, pipe liners, distributors, consultants, former government officials close to oil, and even leaders of two oil cooperatives.

Any such heterogeneous organization in the United States usually includes men with varied backgrounds and interests. Thus, one member of the council—D. A. Hulcy, president of Lone Star Gas Co., Dallas, Texas—was president of the U. S. Chamber of Commerce. Another has seven homes and belongs to 27 famous social clubs. B. A. Hardey of Shreveport, La., helps support a Texas League ball club. J. R. Parten is regarded as the best-dressed man in Texas. N. C. McGowen, president of the United Gas Corp., an active church worker, is a Knight in Catholic organizations. Stuart M. Crocker, chairman of the board of the Columbia Gas System, has led more major charity drives than he can recall. A. Jacobsen, president of Amerada Petroleum Corp., who was born in Denmark but is now a U. S. citizen, was knighted this year by the King of Denmark. H. S. M. Burns, president of Shell Oil Co., was born in Scotland. Several were bankers, and Joseph E. Pogue, a member of the council, is an officer of the Chase National Bank. R. L. Tollett, president of the Western Petroleum Refiners Association, is a former FBI man. Max W. Ball is a celebrated oil writer and speech maker as well as oil and gas consultant and former head of the government's oil and gas division. Bruce K. Brown, president of Pan-Am Southern Corp., New Orleans, is fascinated by patent law work, and has been inventing things since he was 10 years old. He was deputy petroleum administrator until June, 1952. At least 15 left their jobs to help the government win the war, and others stayed with their companies for the same end. Many have awards from President Truman for the service.

Forty-six members have been on the rolls since the organization was created. These, in particular, treasure membership as a paramount honor and a chance for patriotic service.

The council has an award from the Treasury Department for cooperation with government defense bond campaigns. Secretary of the Treasury John M. Snyder has talked before the council, and Mr. Hallanan has urged members to help out. Actually, the government says employees of American oil companies are buying $30 million a year in bonds, a buying that borrows force from oil company moves to add company funds to employee savings.

"You take Dr. Robert E. Wilson, chairman of the board of Standard Oil Company of Indiana," says James V. Brown, the secretary-treasurer of the council since it was formed. "He hasn't missed a meeting. It's an astonishing record, when you consider all the demands upon his time, his company, his civic interests, his speaking engagements." Actually 65 is a good attendance, although absentees often send representatives.

At times a member will telephone that he cannot make a meeting, try as he will. "Can the date be changed?" he will ask. The date has been changed on occasion, but more frequently, oil men break engagements to be on hand.

The chairman of NPC is Walter S. Hallanan, a vigorous, forceful man of 62 with wide interests. Once a newspaperman in West Virginia, he became in 1923 one of the organizers of the Plymouth Oil Co., Charleston, W. Va., of which he is president. He has been a member of the Republican National Committee for 24 years, more years than any other present member. He plays a prominent roll in the Republican National Convention every four years. The council displayed an independence of politics by re-electing him as chairman in 1949, right after the national elections that substituted a Democratic for a Republican majority in the U. S. Congress. Mr. Hallanan has been chairman during the whole life of the council. This year members gave a banquet in his honor in Washington. In a rare display of candor, Secretary Chapman there confessed that he was learning for the first time of the Republican activities of this man that he, a stalwart Democrat, had named to the council year after year.

Perhaps the biggest job for Mr. Hallanan during the years has been to convince the oil and gas industry it can support the council without being swallowed by government. Industry went along, if timidly at first. Atlantic Refining Co., which once refused to take part, now has its chairman, Robert H. Colley, on the council. Sun Oil Co., which dropped out in 1947, is alone among the big companies refusing to join. Some companies fear a "trap" whereby the Justice Department may some time find the council an illegal combination, despite Justice's clearance of the present setup.

At present, the task of coaxing forth patriotic and philanthropic impulses of the industry to aid government is an accomplished fact. Beyond that, there are those who see certain concrete gains for the industry, as well as for the nation, from this government-industry teamwork. "The cooperative endeavor has actually been a roadblock against those whom we know have a deep and lingering desire to regiment the oil industry and bring its facilities under direct government control," says Mr. Hallanan.

The furor in connection with the birth of the Petroleum Administration for Defense is a case in point. First, the council, at the request of government, suggested a certain type of setup in the event of emergency. This came after a study by a committee under B. Brewster Jennings, president of Socony-Vacuum Oil Co. The council repeated its support of the Jennings report as the Korean War began. The suggestion was ignored by Secretary Chapman, however, who announced he would form a Minerals and Energy Administration to handle coal, oil, gas, electric power, minerals and fish. Non-oil officials would have a veto power over oil and gas matters. The council bucked. A trouble-shooting team of Mr. Hallanan, J. R. Parten and J. Howard Marshall took up the matter with the Secretary. The next day, the Secretary, striding into an excited meeting of the council, said he'd changed his mind: he would throw aside the MEA and give the council members the type of PAD they said they needed to do the defense job.

At another time, former Secretary of the Interior J. A. Krug went to Congress to speak about government funds for coal-to-oil plants. A team of council members went to see him about it. They requested,

perhaps with some heat, that in the future he seek the advice of the council first. The record shows that, to this day, government officials tend to think of going to the council first, for the facts, and speaking out only afterwards.

At this time, a committee of the council headed by W. S. S. Rodgers, chairman of the Texas Co., is winding up an exhaustive survey of the costs of making petroleum from coal and oil shale. Several hundred thousand dollars have gone into the enterprise. If the findings fail to square with certain theories in government, they will be nonetheless welcome, and even more essential as guide posts for the U. S. Congress in a major issue of the day.

As might be expected, council operations are hemmed in with certain taboos, some springing from antitrust laws, some from the council's by-laws, and some from good taste. This accounts for rejections of some requests of government for studies. The council does not undertake studies on its own.

The council thus refused to undertake a study of gas flaring and ways to combat it, suggesting that the state and federal governments work this out together. Again, it refused to set up a Military Petroleum Advisory Committee, suggesting that the government set up another group. The council agreed to help the government improve its collection of oil production figures, but refused to let a council committee work directly with government on this, but only through the council. Again, the council refused to estimate future demands for petroleum products, stating the government has the facilities for this. Once it opposed a study of supply and demand for natural gas and heating oil on the ground this would get into competitive interplay between oil, gas and coal, and the effect of prices, one of the hard and fast taboos. This year, the council refused to suggest ways to carry oil from the Gulf to the East Coast overland in event war shut tanker lanes saying this involves recommendations which, the council said, are none of its business.

The biggest laugh came as the council hesitated at one venture urged by a Secretary. "They don't indict Secretaries of the Interior," explained B. L. Majewski, president of Great American Oil Co. "Oh no?" shot back the Secretary, apparently thinking of Albert Fall of Teapot Dome days. "You have a short memory."

A. Jacobsen of Amerada Petroleum Corp., chairman, and the members of the agenda committee realize perhaps more than the average council member that there has been a remarkable degree of evolution as the organization went on. In the early days the council refused to make one study saying it cannot be "the medium for securing estimates of reserves and availability," and several times the council insisted it would not forecast. Today, however, the major recent work of the council is the report of L. F. McCollum, president of Continental Oil Co., estimating oil availability at home and abroad through 1955. A 33 percent increase over five years to a maximum of 16 million barrels daily by 1955 is foreseen. Of this, nearly nine million barrels would be from the United States, three million from elsewhere in this hemisphere, and four million from the Eastern Hemisphere.

Once the council refused to make a study on trends in installation of petroleum consuming equipment, such as oil burners, but only recently the council agreed to go ahead with this on a second request, but warned its committee against any forecasts.

The council committees once were directed to "report and recommend" but along the road they were forbidden to recommend. This was pointed up when the oil imports crisis was dumped into the lap of the council in 1949. Agreeing to get the facts, the council flatly warned against "plans and programs."

The imports report stands today as a major contribution of the council to problems of government. At a time when wild charges were being made, the calm assertion of the council that imports have "hurt the domestic oil industry" and may cause serious harm, served to bring about independent action by individual companies.

On the positive side, the council's work has produced a pile of reports standing six feet high, which forms an invaluable reference library for oil men and government. Some reports are eagerly sought by libraries over the country. Congressmen write for others. Government officials find they contain facts unavailable anywhere else.

Like the imports and McCollum reports, the petroleum policy statement of the council stands today as a major document. From time to time, it becomes the basis for Congressional argument, if not action, and is looked to as a guidepost, in however general terms, for industry.

Other reports, equally if not more important, may sound less exciting. One document, prepared after a tedious check with thousands of oil producers, set forth sizes of steel tubular goods producers prefer. The steel industry has this as a reference book today. Another report said that many giant salt domes and other natural cavities over the nation furnish good petroleum storage, within certain limits. The boom in use of radio and radar by oil and gas, calling for ever more materials and frequencies, is the subject of a study under way today. A statistical series covers a wide range of subjects including figures on military and government petroleum demand, the steel, manpower, chemicals, quebracho and other needs of oil and gas, figures on tank trucks, transportation, pipe lines, liquefied petroleum gas, storage capacity and others.

The "million barrel committee" set out for the first time the cost in steel and dollars of an overall expansion of the petroleum industry to turn out a million barrels daily more of products. The dollar cost: one billion dollars, exclusive of costs of exploration and production, which are hard to estimate. A total of 3.2 million tons of steel is needed.

A survey of council activity discloses a remarkable degree of silence on the major issues in petroleum today, such as tidelands ownership, depletion allowance, price controls, the Kerr natural gas bill and the like. That must be so, the council being what it is. However, the organization could hardly do anything without touching on these matters. Thus, the record is clear that the council prefers the depletion allowance to stay at 27.5 percent as it is, that prices for crude oil and products be fair, that taxes be held to reasonable levels, and that the states control the offshore or submerged areas. While the council has refused to go into tidelands ownership, it is making a study today of the oil and gas availability there, which is awaited with keen interest by members of the industry and others.

Unique in many respects, the council can point to the election of its own chairman, as against a government official, as a chief distinguishing mark. No other industry advisory group has this arrangement. This fact prompts some quizzical glances at NPC from time to time, including a blast every so often from a Congressional committee headed by an anti-oil congressman. The blasts get nowhere, as the Justice Department has given its approval from the start. Not long ago a move to take away the council's industry chairman cropped up in one government agency. Oil men came to Washington about it, only to find Secretary Chapman saying he is four-square behind the council as is. He went to President Truman about it, who promptly advised a press conference he wants the organization to go on unchanged. That, apparently, ends the matter.

The hearty give and take of information and ideas between government and industry—through the council—has gone on for so long and with such high praise, that the council is regarded as a permanent fixture. It is habit, in some quarters, to speak of the council in almost sacrosanct tones. The respect with which the council treats itself no less than the respect which it has won may be part of the reason. At any rate, Secretary Chapman frequently has praised the council. "Your work has made this government-industry team outstanding in all of Washington," he recently said. Officials of the military, in particular, have been enthusiastic about the council's deeds. In praise of the council, Senator J. W. Fulbright, D., Ark., says, "It has been willing to bend a back in work, but not to bend a knee in subservience, and its insistence on independence has become an essential of the cooperation to which the council has given itself."

# SECRETARY CHAPMAN PRAISES WORK OF FOREIGN SUPPLY GROUP

**By Joseph Huttlinger**

A BROAD SEGMENT of the federal government is paying high praises today to operations of the American petroleum industry abroad at a time when others in government are in the midst of attempting to prove the existence of a widespread, illegal cartel.

The praise comes from Secretary of the Interior Oscar L. Chapman, who also is Petroleum Administrator for Defense, and from virtually every top official in the defense program.

In particular, they single out the teamwork shown during the past 17 months by 19 American oil companies who are working hand in hand at the request of the government to cope with the threat of world oil shortages. The companies sent top executives to join the government-sponsored Foreign Supply Committee of oil men.

Of a recent report from the committee, Secretary Chapman said publicly:

"There can be satisfaction in this accomplishment for everyone concerned, the government that co-ordinated and directed the effort, and the 19 companies that participated through the plan and by other means to make up the deficit."

The committee report, the final one on plan of action operations, the heart of the program, stated that 46,000,000 barrels of oil products had been sold or exchanged under the program during the year ending July 2, 1952. Of the total, 19,500,000 barrels was crude oil and 26,500,000 products. In general, the sales were between a company in the plan and one of three companies which had looked to Iran for supply. One of 26 schedules aimed to break a bottleneck in European refineries.

The Secretary went on: "These figures are a tribute to the highly effective job the petroleum companies, domestic and foreign, have done in overcoming a threatened shortage that could have done incalculable harm to the defense of the free countries. The shortage had to be overcome."

The Secretary pointed out that the U. S. is sending machinery to Europe as part of the defense program, and said it would be futile if oil were not supplied. He added: "Through the plan of action, we avoided that absurdity at a time when the loss of Iran's production threatened to bring Europe's wheels to a standstill."

This kind of oil company cooperation would be illegal under American antitrust laws, except for the Defense Production Act which was enacted after the start of the Korean war. This act permits, even encourages, "voluntary agreements" by companies under sponsorship of the government, when needed to meet urgent supply and other defense needs. Thus, it was the government which sponsored such a program for foreign oil supply.

The program was conceived in 1951 when oil shortages were the threat. The shutdown of Iran was in sight, and airplanes in the Middle East already were grounded for want of aviation gasoline. Other tight supply spots were appearing, and defense needs were climbing.

Then, the voluntary agreement to set up the oil committee was drawn up. It carried the approval of the PAD, the bulk, if not all, of Cabinet members, and the Justice Department. On June 28, 1951, Defense Mobilizer Charles E. Wilson, second only to President Truman, asked the companies to take part. It would "greatly assist" the defense build-up, he said. Defense Production Administrator Manly Fleischmann later asked the companies to adopt plan of action No. 1.

Under the plan of action, the members of the committee pooled distribution, storage, tanker and other facilities, swapped products and cooperated to spur oil production. Each transaction or schedule was at the specific direction of the PAD, although the committee often had first suggested it. The termination of the plan of action in July of this year was explained as due to the "very success" of the enterprise.

The foreign supply committee, still feeling the momentum of the plan of action work, is continuing in business, but largely restricted to sending factual information to the PAD and others in government. At any time, however, it stands ready to put in another plan of action, if needed. As for the factual reports, J. Ed Warren, deputy petroleum administrator, calls them "essential." He says: "This agency would be ill able to cope with the world oil supply problems that we face without this committee and these reports."

The 19 companies which participated in the plan are: Arabian American Oil Co., Standard Oil Co. (N. J.), Creole Petroleum Corp., Esso Export Corp., Gulf Oil Corp., Standard Oil Co. of Calif., The Texas Co., Barber Oil Corp., Brighton Terminal, Ltd., Caltex International, Ltd., Caltex Oil Products Co., California Texas Corp., Overseas Tankship Corp., Caltex Oceanic, Ltd., Socony-Vacuum Oil Co., Inc., Tide Water Associated Oil Co., Standard-Vacuum Oil Co., The Atlantic Refining Co., and Venezuelan Petroleum Co.

# OIL INDUSTRY "MAKES-DO"

**By J. Ed Warren**
Deputy Administrator, Petroleum Administration for Defense

*J. Ed Warren, deputy administrator of the Petroleum Administration for Defense, is working for the federal government for the second time in his career. Back in 1925 he was a junior petroleum engineer for the U. S. Geological Survey, but resigned in 1926 to join Marland Oil Co. in the Texas Panhandle. He remained with Continental Oil Co. as a district production superintendent after the Continental-Marland merger, but resigned in 1934 to take an interest in the Carl B. King Drilling Co. He later was made president of the drilling company and became a partner in the producing firm of King, Warren and Dye. Both firms have operated principally in West Texas. Mr. Warren has been active in association work. He has served as president of the American Association of Oil Well Drilling Contractors and of the Independent Petroleum Association. His interests have extended to professional societies and to groups such as the National Petroleum Council and the American Petroleum Institute.*

A FEW WEEKS—sometimes even a few days—can bring many changes in the fast-moving oil industry.

If this article had been written in the first week of August, it would of necessity have been a gloomy piece. Effects of the May strikes in petroleum were still very much with us, triply compounded by the effects of the steel strikes in June and July. It was easy enough to prove from unarguable statistics that we were face to face with widespread, serious supply problems all along the line.

The East Coast, it was perfectly obvious, was going to have a shortage of house-heating oil, kerosine, and diesel fuel if the winter were only as cold as normal. Refineries couldn't possibly produce enough to build up stocks to safe levels.

Production was going to be choked off. During the steel strikes potential production of oil-country tubular goods enough to drill 10,000 wells had been lost. Therefore at best the industry this year could drill 40,000 wells, back practically to 1948 levels.

Transportation and refining projects were going to be delayed six, eight, ten weeks, at a minimum, and some scheduled would not be able to get going at all this year.

These things the statistics demonstrated in cold black and white. But statistics don't always take into account the dynamic nature and ingenious character of the oil industry. They didn't in this case, not by a long shot.

This is not to say that all the prospective problems have obligingly evaporated since the first week in August. They are with us still, but they have shrunk to something like manageable size.

There is a continuing threat of possible shortage of the middle distillates on the East Coast in the heating months ahead. It is a threat that has diminished, though, because ever since they resumed operations in June, the refineries on the East and Gulf Coasts have been operating at from 97 to 99 percent of capacity. This is the highest level of production ever realized over so sustained a period during peacetime, and there were experts who said it couldn't be done. When, in August, PAD found the percentage yield of the distillates had to be increased to meet demands, the refiners promptly made the necessary adjustments.

Although the figures proved that well-drilling must all but come to a standstill for lack of the steel to make pipe, drilling has continued, through at a somewhat slower rate than early in the year. The operators simply improvised, buying foreign and second-hand pipe, drawing on inventory, in general making do with what they had or could somehow get. It now seems probable that there will be some 45,000 to 47,000 wells drilled during the year, more in any event than were drilled in record 1952.

Transportation and refining projects, again because of ingenious improvisation, have managed to go ahead in spite of delays. Some construction time undoubtedly has been lost, but not nearly so much as many originally feared.

As things stand, the refining expansion program, for example, continues almost on schedule. A PAD survey this summer showed that from mid-1951 to July 7, 1952, refining facilities with a capacity of 92,950 barrels a day had been completed. By the end of this year, it was estimated, facilities with an aggregate capacity of 528,600 barrels a day will have been completed; the figure is expected to go to 742,460 barrels a day by July 1, 1953, to 1,078,100 barrels a day by January 1, 1954, and to 1,215,000 barrels a day shortly after that.

Forecasting is a necessary function in anticipating and preparing for the future. Nevertheless it is important to remember that even with careful and skilled analysis of the available information, new and unpredictable conditions often alter the best of estimates. It appears at the present time that there is one brightening spot on the horizon to which attention should be called: the extremely tight supply situation in oil-country tubular goods that has persisted since even before the Korean invasion may at last be easing.

A major factor in the continuing shortage of casing and tubing has long been the lack of mill space for its production. Now three mills have under construction new facilities that will substantially increase their capacities.

For this fourth quarter of 1952 the available capacity—almost completely devoted to the filling of third-quarter orders—totals 465,000 tons. In the first quarter of 1953 that capacity should be up 7,500 tons to 472,500. In the second quarter it should be up another 15,000 tons to 487,500. Third-quarter regular production should be 525,000 tons, an increase of 37,500 tons over the second quarter, and fourth-quarter production should be 540,000 tons, still another increase of 15,000 tons.

We at PAD are also engaged just now, working through and with the Mutual Security Agency, in an effort to boost production of oil-country tubular goods abroad. Exact figures are unavailable, but PAD estimates that the 1951 output of such goods in the United Kingdom and Europe this side of the Iron Curtain was roughly 170,000 tons. For 1952 we estimate the production at about 250,000 tons, since there was an increased demand from United States operators during the steel strikes. We are sure, though, that the production can be increased substantially, for many of the mills are working only one or at most two shifts. If these mills will turn out more casing and tubing, their own operators will be able to buy this pipe instead of taking some of the United States' production, and U. S. operators who want to buy foreign pipe will find a larger supply available. While we do not wish to continue allocating oil-country tubular goods any longer than absolutely necessary, it now appears that even with the expected additional production, demand will exceed supply for many months to come.

Even if the scheduled domestic expansion of capacity is achieved, and even if the foreign production is increased, there will still be problems, of course. Chief of them will be the continuing struggle to get shapes and forms of steel to use the capacity. No one even now can be quite sure how long the effects of the steel strikes will linger, though everyone hopes all slack will have been taken up by the second quarter of 1952. At a minimum, though, it can be said that the outlook ahead is brighter than it has been for many months.

There is still an urgent need for continued expansion of the industry. Civilian demands continue to increase constantly. Military demands are greater than ever now that new equipment has finally progressed beyond the drawing-board and test stages and is rolling off the assembly line in quantity. During fiscal 1952 the armed services took some 150,000,000 barrels of petroleum products; during the current fiscal year they plan to take a total of some 200,000,000.

In a recent report to the Congressional Joint Committee on Defense Production, PAD briefly summarized the three main problems confronting it. These are, in a real sense, the industry's problems as well, since the agency—as always—counts completely on the cooperation of the industry in the discharge of its responsibilities for the defense of the free world. Only with that cooperation can it hope to succeed in its important task. The major problems are these:

1. To insure sufficient materials, particularly steel, to permit fulfillment of the essential expansion goals for the oil and gas industries and distribute the goods in accord with the demands of defense and of equity among operators.

2. To insure sufficient supplies of petroleum products—especially aviation gasoline, diesel fuel, jet fuel, and Navy special fuel oil, which continue to be in tight supply—to satisfy the needs of the military.

3. To insure production, transportation, and distribution of enough middle distillates—kerosine, home-heating oil, and diesel fuel—to the East Coast to prevent a shortage there during the winter months of peak demands.

# World production higher

WORLD PRODUCTION of crude oil averaged 12,321,400 barrels daily in the third quarter of this year according to estimates gathered by WORLD PETROLEUM. Adding natural gas liquids, the petroleum hydrocarbon supply has exceeded 13 million barrels daily in the three-month period. This was an increase of 322,100 b/d over the three months ending June 30 during which crude production in the United States was off 421,700 b/d because of the oil field strike in May. In that month United States production averaged only 5,107,000 b/d, compared to an average of well over 6.3 million barrels daily in the first four months.

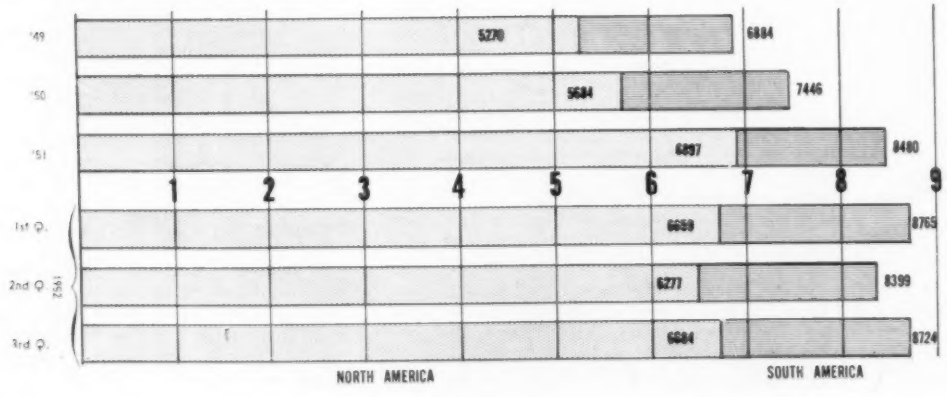
Assuming that fourth quarter crude output continues at about the recently reported level, it may be estimated that world output for the year will approximate 12,180,000 b/d. This compares with 11,790,300 b/d in 1951. The increase is expected to be about 3.3 percent. Such an increase suggests that the historic long-term rate of rise in demand has been resumed after several years of unusual increases following the close of the war. In 1951, the increase in crude production was 13 percent over 1950 which was, in turn, 11.5 percent higher than 1949. Oil inventories increased very substantially in 1951 so that the change in crude output is not a true index to change in demand for petroleum products.

Latin American production outside of Venezuela has shown little change this year. Venezuela output was stepped up more than 200,000 b/d in 1951, jumping from an average of 1,498,000 b/d in 1950 to 1,704,600 b/d in 1951. Pressures behind this increase were largely caused by the shutdown of Iranian fields at midyear.

Now that the loss of oil in Persia has been made up by other Middle Eastern fields, this pressure has been relaxed and Venezuelan production has tended to recede. Peak this year was in May during the United States oil strike. In that month the average was 1,844,400 b/d. Settlement of the strike and a reappraisal of oil demand caused July output to be reduced to 1,803,000 b/d, August to 1,724,200 and September to 1,716,000 b/d.

Production in Mexico is being maintained at recent levels through the development of newer fields. The Tenixtepec discovery between Poza Rica and the old Golden Lane gives promise of being a substantial field. The second well was rated at 5,000 b/d. The Rabon Grande field discovered a little over a year ago by Mexican American Exploration Co. is now producing about 8,000 b/d. Poza Rica output is tending to decline. It now appears somewhat doubtful whether a goal of 80 million barrels of crude output will be reached this year. Total output may miss the mark by about two million barrels.

TREND OF WESTERN HEMISPHERE CRUDE PRODUCTION



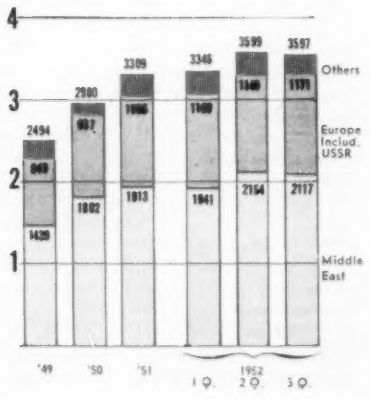
Canadian output reached its peak for this year at about 190,000 b/d in August. The shutting in of transportation on the Great Lakes until next spring will tend to restrict output to the operating capacity of Prairie Province refineries and of empty storage capacity. A little oil is moved by tank car during the winter, but not in significant quantities. Development of known fields in Alberta and the wildcatting in both Alberta and Saskatchewan is increasing the productive capacity of Canadian fields so that the Pacific Coast area can be supplied in another year when the Transmountain pipe line is completed. Elsewhere in this issue a review is given of first half operations.

Soviet Russia has adopted a new crude production goal far in advance of previous plans. The new goal is 1,400,000 b/d of crude output in 1955. This compares with a production of 760,000 b/d in 1950 and of about 842,000 b/d in 1951. Previous post war target was 1,200,000 b/d in 1960.

Current estimates are that this year's production will average about 925,000 b/d. During the third quarter it is suggested that Russian output may approximate 945,000 b/d.

In other Iron Curtain countries no such rate of increase has been established. Romanian output was officially announced for 1951 at about 120,000 b/d. Elsewhere in this issue an article by G. G. Rosu sug-

**TREND OF EASTERN HEMISPHERE PRODUCTION**




**DOMESTIC DEMANDS FOR MAJOR PRODUCTS**

(thousands of barrels)

Estimated by U. S. Bureau of Mines

| | Motor Fuel | Kerosine | Distillate Fuel Oil | Residual Fuel Oil | Lubricating Oil | Year 1951 Total Major Products | Year 1950 Total Major Products |
|---|---|---|---|---|---|---|---|
| **NORTH AMERICA & CARIBBEAN** | | | | | | | |
| Alaska & Hawaii | [a]3,982 | 143 | 3,536 | 4,829 | 133 | 12,623 | 10,587 |
| Canada | 57,818 | 9,964 | 26,331 | 36,990 | 2,781 | 133,884 | 118,383 |
| Central America | 2,582 | 462 | 3,349 | 6,307 | 113 | 12,813 | 10,900 |
| Cuba | 3,823 | 566 | 1,264 | 9,469 | 222 | 15,344 | 13,949 |
| Mexico | 16,782 | 5,340 | 5,410 | 27,826 | 610 | 55,968 | 50,900 |
| Puerto Rico | 2,425 | 650 | 254 | 2,810 | 71 | 6,210 | 5,178 |
| United States | 1,090,354 | 123,719 | 449,140 | 563,771 | 42,304 | 2,269,288 | 2,098,775 |
| Other W. Indies | 2,710 | 460 | 9,090 | 31,275 | 200 | 43,735 | 39,815 |
| **SOUTH AMERICA** | | | | | | | |
| Argentina | 13,700 | 5,700 | 6,600 | 34,100 | 1,100 | 61,200 | 56,500 |
| Bolivia | 500 | 77 | 163 | 425 | 13 | 1,178 | 879 |
| Brazil | 17,150 | 2,300 | 5,080 | 13,175 | 950 | 38,655 | 31,302 |
| Chile | 2,357 | 478 | 1,005 | 5,355 | 190 | 9,385 | 7,491 |
| Colombia | 4,048 | 636 | 934 | 2,940 | 150 | 8,708 | 7,466 |
| Ecuador | 697 | 131 | 237 | 743 | 25 | 1,833 | 1,798 |
| Peru | 3,165 | 1,098 | 967 | 4,388 | 119 | 9,737 | 8,856 |
| Uruguay | 1,650 | 944 | 807 | 3,910 | 65 | 7,376 | 6,745 |
| Venezuela | 7,290 | 2,080 | 5,270 | 10,609 | 278 | 25,527 | 20,540 |
| Other | 200 | 70 | [c]130 | ——— | 30 | 430 | 230 |
| **WESTERN EUROPE** | | | | | | | |
| Belgium & Lux. | 7,493 | 416 | 3,966 | 7,602 | 666 | 20,143 | 16,577 |
| Denmark | 3,850 | 556 | 2,884 | 4,550 | 296 | 12,136 | 9,963 |
| Finland | 2,240 | 484 | 1,034 | 638 | 160 | 4,556 | 3,745 |
| France | 25,675 | 1,110 | 12,550 | 40,171 | 2,752 | 82,258 | 72,685 |
| W. Germany | 13,734 | 416 | 12,195 | 7,904 | 2,448 | 36,697 | 24,685 |
| Greece | 2,081 | 631 | 1,986 | 3,850 | 120 | 8,668 | 7,968 |
| Iceland | 420 | 18 | 673 | 480 | 24 | 1,615 | 1,410 |
| Ireland | 2,380 | 771 | 657 | 1,714 | 106 | 5,628 | 4,714 |
| Italy & Trieste | 7,169 | 1,938 | 7,437 | 25,602 | 1,112 | 43,258 | 31,705 |
| Netherlands | 6,150 | 2,050 | 6,410 | 13,710 | 530 | 28,850 | 26,070 |
| Norway | 2,320 | 370 | 4,375 | 5,200 | 270 | 12,535 | 10,365 |
| Portugal | 1,386 | 925 | 1,668 | 2,793 | 133 | 6,905 | 4,360 |
| Spain | 4,428 | 229 | 2,350 | 3,325 | 480 | 10,812 | 10,161 |
| Sweden | 7,694 | 2,320 | 10,100 | 12,850 | 620 | 33,584 | 26,040 |
| Switzerland | 2,846 | 690 | 4,634 | 497 | 372 | 9,039 | 8,057 |
| U. Kingdom | 52,875 | 13,984 | 27,483 | 43,910 | 5,668 | 143,920 | 124,405 |
| **MIDDLE EAST** | | | | | | | |
| Bahrein Island | 90 | 50 | 983 | 6,587 | 12 | 7,722 | 6,187 |
| Jordan | 230 | 190 | 99 | ——— | 8 | 527 | 428 |
| Iraq | 900 | 880 | 970 | 2,000 | 100 | 4,850 | 4,515 |
| Israel | 1,559 | 891 | 936 | 2,888 | 96 | 6,370 | ——— |
| Kuwait | 139 | 53 | 103 | 5,070 | 2 | 5,367 | 5,190 |
| Saudi Arabia | 715 | 52 | 1,520 | 8,056 | 13 | 10,356 | 10,907 |
| Syria-Lebanon | 1,215 | 523 | 963 | 997 | 60 | 3,758 | 3,416 |
| Turkey | 2,090 | 1,325 | 1,100 | 340 | 248 | 5,103 | 4,040 |
| **OTHER ASIA** | | | | | | | |
| Burma | 665 | 291 | 225 | 232 | 47 | 1,460 | 1,259 |
| Ceylon | 979 | 488 | 1,188 | 3,761 | 55 | 6,471 | 6,067 |
| India | 8,050 | 8,623 | 5,685 | 6,547 | 1,290 | 30,195 | 24,875 |
| Indo-China | 844 | 259 | 249 | 194 | 74 | 1,620 | 1,587 |
| Japan | 5,210 | 810 | 2,430 | 13,410 | 1,775 | 23,635 | 15,490 |
| Malaya | 2,409 | 620 | 5,505 | 7,007 | 202 | 15,743 | 9,912 |
| Pakistan | 1,449 | 1,219 | 1,114 | 5,310 | 183 | 9,275 | 6,670 |
| Thailand | 970 | 415 | 900 | ——— | 85 | 2,370 | 2,028 |
| **AFRICA** | | | | | | | |
| Algeria | 1,815 | 454 | 1,029 | 5,809 | 169 | 9,276 | 7,805 |
| Egypt | 2,600 | 4,832 | [b]5,100 | [b]18,900 | [b]365 | 31,797 | 29,341 |
| Ethiopia | 68 | 12 | 75 | 25 | 7 | 187 | 152 |
| Fr. Morocco | 2,139 | 273 | 1,069 | 1,706 | 122 | 5,309 | 3,740 |
| Rhodesia and Nyasaland | 1,130 | 215 | 220 | ——— | 70 | 1,635 | 1,403 |
| Sp. Morocco and Tangier | 249 | 45 | 320 | 2,310 | 33 | 2,957 | 346 |
| Tunisia | 621 | 244 | 594 | 675 | 67 | 2,201 | 1,830 |
| Un. So. Africa | 11,500 | 3,290 | 3,175 | 3,220 | 590 | 21,775 | 17,627 |
| **OCEANIA** | | | | | | | |
| Australia | 18,993 | 3,582 | 8,513 | 10,322 | 1,239 | 42,649 | 37,500 |
| Indonesia | 3,651 | 2,550 | 2,612 | 2,925 | 180 | 11,918 | 14,101 |
| New Zealand | 5,131 | 243 | 1,375 | 2,248 | 223 | 9,220 | 7,427 |
| Philippine Is. | 4,077 | 1,210 | 2,372 | 2,404 | 210 | 10,273 | 9,712 |
| **TOTAL ABOVE COUNTRIES** | **1,453,462** | **215,365** | **670,393** | **1,046,661** | **72,636** | **3,458,517** | **3,106,594** |
| **Daily Average** | **3,982** | **590** | **1,837** | **2,868** | **199** | **9,476** | **8,511** |

[a] Territory breakdown unavailable.

[b] Includes transit trade in ship bunkers.

[c] Includes some residual fuel oil.

gests that last year's output was about 100,000 b/d. This is higher than many oil men in the United States have thought, but far below the Romanian government data. It is known that special efforts to increase output by secondary recovery methods are being made and no new discoveries of importance have been announced. Without new discoveries, it is clear that secondary recovery cannot be depended on to do more than give a temporary boost to production.

Crude production in West Germany has been rising steadily throughout the year as a result of continued active drilling. In the third quarter output averaged nearly 35,000 b/d. In the first half of this year drilling reached a total of 770,000 feet of which about 175,000 feet was in wildcat wells. The increase in crude output was 23 percent over the first half of 1951.

German refinery operations for the year are expected to reach an average throughput of about 108,000 b/d. Of this about 60,000 b/d is imported from the Middle East, about 12,000 b/d from Venezuela and lesser amounts from other sources to supplement the domestic production of about 34,000 b/d. Exports of refined products from Western Germany are about in balance with imports, the total incoming products being only slightly greater than those shipped to other countries, principally to Eastern Germany.

In the middle East there has been a tendency to cut back production in recent months. This has been most apparent in Saudi Arabia and Kuwait. Peak production in Saudi Arabia was 899,000 b/d in June. Average for the second quarter was 870,000 b/d. In the past three months this has been reduced to 816,000 b/d.

Highest output of Kuwait fields was in July at 815,000 b/d. This since has been cut back nearly 100,000 b/d. Average for the third quarter was 740,000 b/d compared with 778,000 b/d in the second quarter.

Much of the reduction in output has been caused by the competition of Iraq oil which now is reaching the Mediterranean in largely increased quantities through the new IPC pipe line. August production of all Iraq fields was nearly 430,000 b/d. Early in the year Iraq production was about 200,000 b/d before the new pipe line was completed and before the Zubair field at the head of the Persian Gulf was in full operation.

In the first half of the year, before the IPC line was completed, oil traffic on the Suez canal continued to increase. Northbound shipments were 23.7 million tons compared with 21.5 million in the first half of 1951. Peak traffic was 47.5 million tons in the full year 1950 before Tapline was put into service. With the IPC line operating there is likely to be a sharp drop in Suez traffic until European consumption begins to catch up with pipe line capacity. Tapline authorities are considering the installation of new pumping stations and looping to increase movement through that line. Nothing has been heard recently about the proposed line from Kuwait to the Mediterranean.

Current development drilling in Kuwait is being centered in the new Magwa area. In the Burgan field drilling is of a fill-in nature.

An interesting sidelight on the future of Kuwait oil was continued in a recent talk by S. A. Swensrud, president of Gulf Oil Corp., before the New York Society of Security Analysts. Mr. Swensrud said that estimates of the Gulf share (50%) of Kuwait reserves have been increased from the former 5-billion barrel figure to "seven or eight or ten billion barrels or more." Part of this must be attributed to the Magwa discovery.

In Saudi Arabia the Arabian American Oil Co. continues its geophysical studies of the desert wastes. No new wildcats were drilled in the first nine months of this year. Development wells drilled in previously discovered fields totaled 29. On September 30 there were 125 producing wells in Saudi Arabia.

Producing capacity of Turkish fields at Ramandag and Garzan now have reached 4,000 b/d according to a recent announcement in parliament. Current production continues at about 500 b/d because of lack of refining capacity. A new plant with a capacity of about 5,000 b/d is scheduled for completion in 1954.

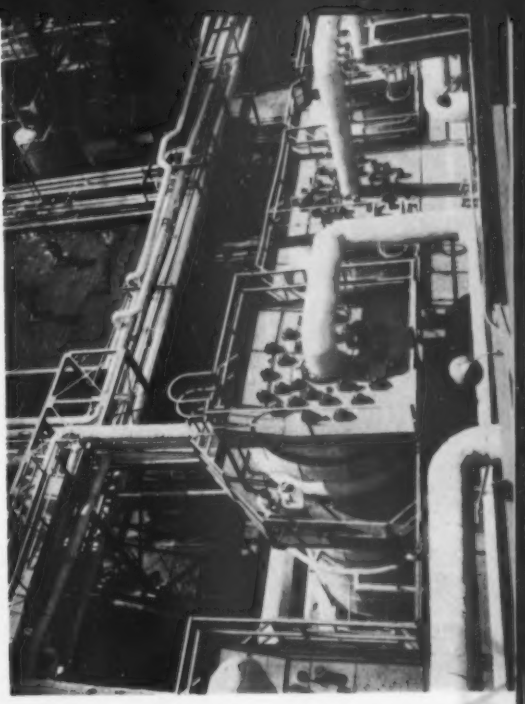
In Oceania the principal event of importance this year has been the inauguration of commercial production from the Minas field in central Sumatra in May. Output of the field now is about 20,000 b/d. The oil is moved by pipe line and barge to the seaboard and by tanker to world markets. Some of the oil is being shipped to California to supplement the deficient local production on the West Coast. Caltex Pacific Oil Co. is operator of the field. Current production of the Far East is about 308,000 b/d, an increase of 29,000 b/d over the 1951 average. Minas is contributing almost the entire increase. The remainder is largely from British Borneo.

In its annual report on world petroleum statistics for 1951 which has just been released, the United States Bureau of Mines estimated that demand for principal petroleum products in 61 countries increased 11.3 percent in 1951 as compared with the previous year. Greatest gains were seen in Asia with Malaya taking 58.8 percent more products, Japan 52.6 percent and India 21.4 percent more products.

South American demand was up 15.7 percent, western Europe 20.3 percent, Middle East 27 percent and Africa 20.7 percent. The Bureau did not estimate the oil demand in Iron Curtain countries. An accompanying table shows demand in the 63 areas as estimated by the Bureau of Mines. For the world as a whole, it has been estimated by C. J. Bauer of Standard Oil Co. (N. J.) that demand for products, including natural gas liquids, averaged 12,134,400 b/d in 1951 as compared with 10,967,600 b/d in 1950, an increase of 10.6 percent. For the current year WORLD PETROLEUM has estimated a probable increase in total world demand of 7.1 percent to 13,025,000 b/d including natural gas liquids. Whatever figure may be achieved, it is clear that the industry has adequately prepared to meet the demand and that next year also will see adequate supplies. In fact, if Iran again should become a producing nation of consequence, it would require some realignment of sources to avoid an oversupply even though the world continues to prosper and demand expands at a satisfactory rate.

**WORLD CRUDE OIL PRODUCTION**
(Thousands of Barrels Daily)

| | 1951 | 1952 First Quarter | 1952 Second Quarter | 1952 Third Quarter |
|---|---|---|---|---|
| **North America** | | | | |
| United States | 6,149.0 | 6,323.0 | 5,902.3 | 6,284.2 |
| Canada | 130.5 | 112.1 | 164.0 | 188.8 |
| Mexico | 210.2 | 214.0 | 211.3 | 211.0 |
| **Total North America** | **6,489.7** | **6,649.1** | **6,277.6** | **6,684.0** |
| **South America** | | | | |
| Venezuela | 1,704.6 | 1,819.8 | 1,833.0 | 1,747.8 |
| Colombia | 105.3 | 105.1 | 107.2 | 109.0 |
| Argentina | 66.9 | 66.0 | 67.0 | 68.0 |
| Trinidad | 57.1 | 57.3 | 57.3 | 57.3 |
| Peru | 44.0 | 44.4 | 44.4 | 45.0 |
| Ecuador | 7.4 | 7.7 | 7.8 | 7.8 |
| Bolivia | 1.4 | 1.5 | 1.5 | 1.5 |
| Cuba | 0.3 | 0.1 | 0.1 | 0.1 |
| Brazil | 1.9 | 2.0 | 2.0 | 2.0 |
| Chile | 2.0 | 2.0 | 2.0 | 2.0 |
| **Total South America** | **1,990.9** | **2,105.9** | **2,122.3** | **2,040.5** |
| **WESTERN HEMISPHERE** | **8,480.6** | **8,755.0** | **8,399.9** | **8,724.5** |
| **Europe** | | | | |
| Romania | 100.0 | 100.0 | 100.0 | 100.0 |
| Austria | 44.0 | 42.0 | 44.0 | 44.0 |
| Germany | 26.5 | 30.2 | 32.8 | 34.6 |
| Netherlands | 13.6 | 13.9 | 14.0 | 13.9 |
| Hungary | 10.5 | 9.5 | 9.5 | 9.5 |
| Yugoslavia | 3.2 | 3.2 | 3.2 | 3.2 |
| Poland | 3.7 | 3.8 | 3.8 | 3.8 |
| Albania | 3.0 | 3.0 | 3.0 | 3.0 |
| France | 5.6 | 6.4 | 7.0 | 7.5 |
| United Kingdom | 0.9 | 1.1 | 1.1 | 1.1 |
| Czechoslovakia | 1.9 | 2.5 | 2.5 | 2.5 |
| French Morocco | 1.6 | 2.0 | 2.0 | 2.0 |
| Italy | 0.4 | 0.8 | 0.9 | 1.2 |
| **Total (Excluding USSR)** | **214.9** | **218.4** | **223.8** | **226.3** |
| USSR | 842.0 | 905.0 | 925.0 | 945.0 |
| **Total Europe** | **1,056.9** | **1,123.4** | **1,148.8** | **1,171.3** |
| **Near & Middle East** | | | | |
| Iran | 350.0 | 32.0 | 32.0 | 31.0 |
| Saudi Arabia | 761.5 | 846.3 | 870.0 | 816.6 |
| Kuwait | 563.0 | 701.0 | 778.0 | 740.0 |
| Iraq | 174.6 | 224.8 | 333.0 | 397.0 |
| Egypt | 44.7 | 45.8 | 45.0 | 45.0 |
| Bahrein | 30.0 | 30.0 | 30.0 | 30.0 |
| Turkey | 0.4 | 0.5 | 0.5 | 0.5 |
| Qatar | 49.6 | 61.5 | 65.6 | 67.0 |
| **Total Near and Middle East** | **1,973.8** | **1,941.9** | **2,154.1** | **2,117.1** |
| **Far East & Oceania** | | | | |
| Indonesia | 151.7 | 154.0 | 165.0 | 178.0 |
| British Borneo | 103.0 | 105.0 | 107.0 | 106.0 |
| New Guinea | 4.8 | 4.6 | 4.8 | 4.8 |
| India | 5.3 | 5.2 | 5.2 | 5.2 |
| Japan | 6.4 | 5.6 | 5.8 | 5.8 |
| China | 2.0 | 2.0 | 2.0 | 2.0 |
| Pakistan | 3.6 | 3.0 | 4.5 | 4.5 |
| Burma | 2.2 | 2.2 | 2.2 | 2.2 |
| **Total Far East & Oceania** | **279.0** | **281.6** | **296.5** | **308.5** |
| **EASTERN HEMISPHERE** | **3,309.7** | **3,346.9** | **3,599.4** | **3,596.9** |
| **WORLD TOTAL** | **11,790.3** | **12,101.9** | **11,999.3** | **12,321.4** |



*Twenty-five hundred Houdry catalyst units oxidize waste gases, creating 7,500,000 Btu. an hour, in this reactor case (nearest camera) at Sun Oil Company's refinery in Marcus Hook, Pa. The waste gases are blown across the catalysts from six cracking reactors.*

# PLATINUM CATALYST AIDS HEAT RECOVERY AT SUN REFINERY

RESULTS OF FIRST commercial oil refinery tests of a recently developed oxidation catalyst have been announced by Eugene J. Houdry, president of Oxy-Catalyst Co., who is recognized as being the father of modern catalytic cracking. The new catalyst is intended to improve combustion efficiency and to minimize air pollution.

First installation has been operating for several months in a Houdry fixed bed catalytic cracking unit at the Marcus Hook refinery of Sun Oil Co. Sun is planning further installations. Cost estimates have been made on a Houdriflow moving bed type unit, and experiments are being conducted on units of the fluid type.

The catalyst also has been employed to reduce the carbon monoxide content of internal combustion engine exhaust gases. Lift trucks so protected are being operated in closed spaces with no danger to personnel.

First work on a catalyst to reduce carbon monoxide content of refinery cracking still gases was undertaken by Houdry Process Corp. several years ago when the Houdry process was new.

It was found that certain metallic oxides such as copper oxide, deposited on a pelleted support similar in character to the natural clay catalyst, would promote the combustion of hydrocarbons and carbon monoxide in the 800°-900° F. temperature range of the flue gas issued from the cracking reactors.

The first Sun Oil cracking units were equipped with an auxiliary reactor, similar in design to the cracking reactors, and filled with this oxidation catalyst. The air was, in accordance with fixed bed practice, carried to and from the catalyst bed through perforated pipes. Molten salt circulated through finned tubes removed the heat liberated.

Since the process was cyclic, the $CO_2$ flue gas content varied during the regeneration period from less than two percent to more than double that amount.

The first period of operation was quite successful, resulting in complete oxidation of combustible material present. However, the catalyst life was short, due to sulfur compounds, and the maintenance costs excessive. Since problems of air pollution could be minimized by proper operating precautions, the reactors were taken off service after several years' operating at declining effectiveness, pending development of a more satisfactory catalyst.

When Oxy-Catalyst, Inc. announced development of a catalytic oxidation unit[1] capable of burning the combustible components of gasoline engine exhaust, a new development program was started to determine the possibility of industrial use in Sun Oil Co. refineries. Small scale experiments were conducted for several months on regeneration flue gases from fixed bed and moving bed units.

A thorough survey was made of the effect of time contact, initial gas temperature, oxygen concentration, and carbon monoxide concentration on the rate of oxidation of carbon monoxide and hydrocarbon vapor.

It was found that, at the proper time contact, complete combustion of carbon monoxide could be achieved at practically theoretical oxygen concentration. Combustion could be initiated at inlet temperature as low as 400° to 500° F., and in the upper range of carbon monoxide concentration, approximately six percent by volume, the catalyst could stand final temperatures of the order of 1,800° F.

For the first commercial experiment, one of the Houdry fixed bed units of the Marcus Hook refinery was selected, since the existing equipment was available and could be adapted with only minor changes and a minimum amount of new materials.

The catalytic elements are composed of ceramic sticks, approximately six inches long, covered with an active, platinum base film, and arranged in staggered rows between ceramic plates three inches square. The free space for gas flow is about one-half the total cross section. The gas flows across the sticks and the oxidation reaction takes place at the surface of the active elements. The pressure drop is negligible.

The existing oxidation reactor was emptied of the old pelleted catalyst, the distributing perforated tubes removed, leaving in the former reaction space only the salt-cooled tubular elements. A stainless steel grid support, fabricated of salvaged material, was installed on top of the cooling elements and the catalytic elements simply stacked five high on the grid. Some 2,500 were installed. A space was left for insulation between the outside elements and the upper part of the shell, with adequate clearance and expansion.

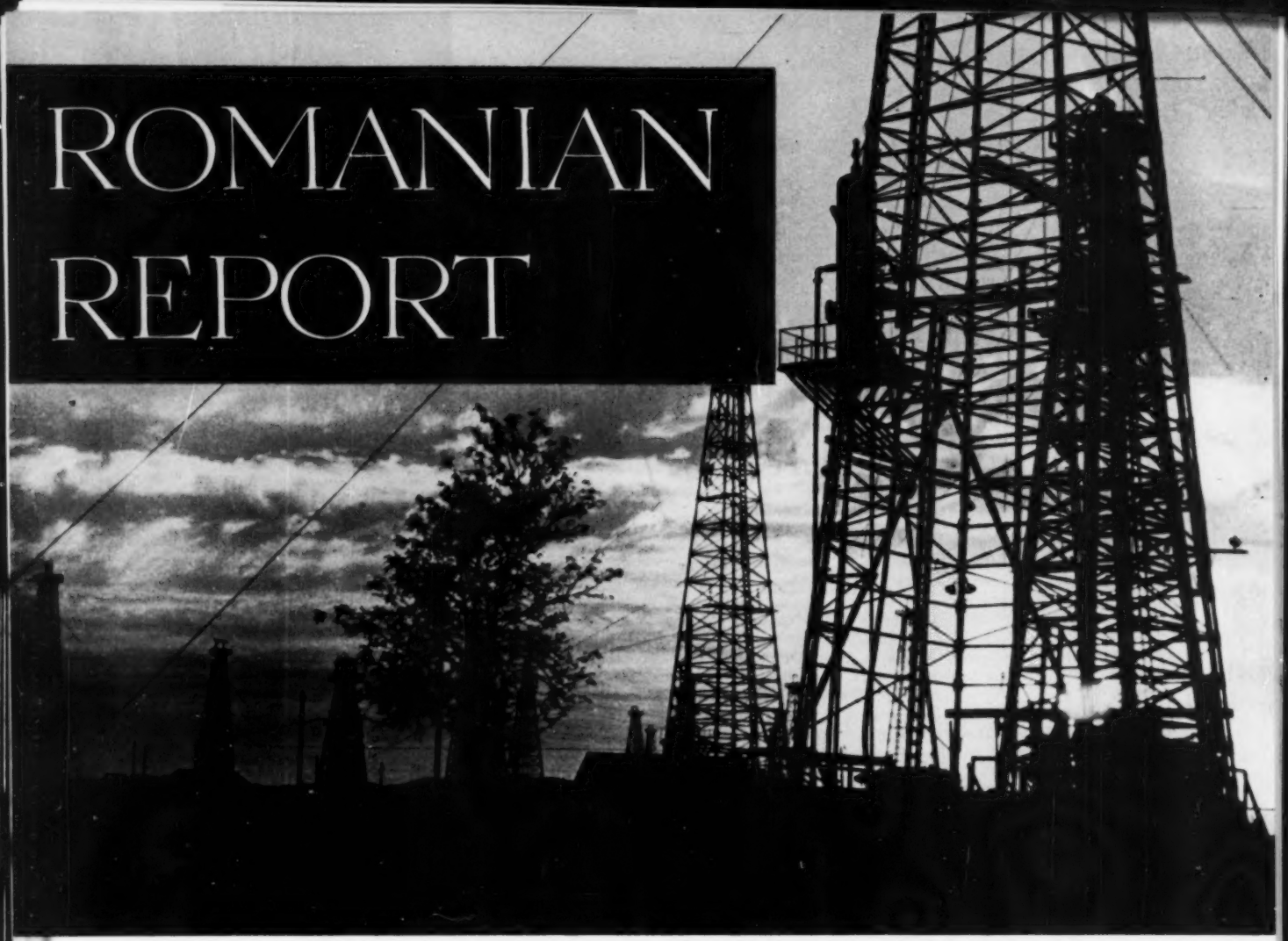
The oxidation reactor is part of a large 12-case cracking unit, 40,000 cfm of regeneration air are furnished by a turbo compressor, the flow being equally divided between two groups of six cases, each equipped with an oxidation reactor. One single reactor has been equipped at the present time, and since there is a deficiency of oxygen at the beginning of the cycle, complete combustion cannot be accomplished. The cycle of each group of six cases is, however, staggered, the cycle on one side starting half way through the cycle on the other, thus in a complete installation it is possible by proper arrangement of piping to mix the two streams in order to provide enough oxygen for complete combustion.

The single unit has been in continuous operation for four months. The flue gas contains an average of three percent carbon monoxide. Approximately two-thirds of this carbon monoxide is converted to carbon dioxide, with the production of 7,500,000 Btu. per hour. The flue gas enters at 775° F. and the average temperature, just after leaving the catalytic elements, reaches approximately 1,075° F The circulating salt cools the flue gas to

*(Please turn to page 124)*

[1] WORLD PETROLEUM, July Refinery Issue, 1952.

# ROMANIAN REPORT



*Lacking adequate equipment and trained personnel, government operation of the Romanian oil industry has been unable to restore pre-war production. The future outlook is not promising.*

By GEORGE ROSU

THE ODYSSEY of the Romanian oil industry since the Russian occupation in the summer of 1944 is probably without precedent in petroleum history. Up to that time private corporations entirely owned by, or with preponderant, foreign interests controlled approximately 87 percent of the crude output as well as the biggest processing plants. Since 1944 the foreign and private managers have administrated their assets only in name. Every minute detail of operation plans had to be first approved by the Soviet Military Administration.

The price fixing system put the burden of the war reparations payment mainly on the foreign corporations, as their products were paid for at about a third of the actual Gulf quotations. The ensuing inflation eroded all their reserves, so that they were forced to live on the meager credits

granted by banks or the Treasury. The discriminatory exchange rate applied during the monetary reform of August 1947 completed the draining process.

The period prior to the nationalization law of June 1948 was a slow agony, during which trumped-up sabotage suits—regularly ending in penalizing private companies with huge fines—helped the Government to relieve itself of any legal necessity for compensating owners when private assets were expropriated. The companies were accused mainly of nonfulfillment of the drilling and production programs. Yet the Romanian Government and the Soviet occupation authorities withheld and blocked the financial means needed to fulfill the targets. Most of the pipe reserves were carried away by the Russians late in 1944 as "war-booty."

As the bulk of the annual reparation quota was paid in oil products, the Russians were unwilling to allow the export of some 1 to 1.5 million barrels of products to Western countries that would have enabled the private corporations to replenish their stocks of casing and drill pipe and, thus, to carry out the drilling targets.

The following two years, 1949 and 1950, were used to prepare the ground for the forthcoming long-term planning, through the application of successive one-year economic plans. As comparative figures submitted later in this article show, the targets set for 1949/50 have not been fulfilled. During this interval the Russians' attention has been focused upon stringing and tuning the Romanian oil industry for higher and more lasting objectives, as this period has been used to terminate the inventory taking, to concentrate the production means and to attain a sweeping centralization of all operations under a single roof.

Sovrompetrol (SRP) was established between May and July 1945 as a joint stock company, to which the Romanian Government contributed its oil interests and fields as well as the assets of the two biggest Romanian oil companies—without even asking the approval of the private stockholders—whereas Russia contributed the German assets. This occurred before the opening of the Potsdam Conference which disposed of the German external assets. Russia alone decided what was an enemy asset. The consequence was that many assets of other foreign governments were included in the enemy category.

At the end of these operations Russia owned 3.2 billion lei of a total stock capital of 11.1 billion lei (at 1940/41 value) of the producing and processing corporations. Out of this she contributed 2.4 billion lei to the capital of SRP. The balance of 800 million lei of stock—to which corresponded assets of nearly 10 billion lei—remained as Russian assets and have since been operated extra-territorially by the "Administration of Soviet Goods and Interests Abroad," an organization attached directly to the Soviet Council of Ministers.

During its short existence the SRP's by-laws were amended several times and each time its authority was widened. Finally the last and major amendment of August 1949 gave it the management of the whole Romanian petroleum industry. This ending was as much foreseeable as it was unavoidable. On the one side SRP was initially granted the monopoly over oil export as well as the exclusive privilege of disposing of the acquired foreign currency. Hence only this company was actually in a position to import badly needed oil equipment. The two biggest Romanian steel and metallurgical industries equipped to produce essential though less specialized equipment also became joint Soviet-Romanian companies. Thus half of their output is Russian property. If this is used for oil development, these steel products become automatically Soviet investments.

Since the end of 1948, operations have been divided between the Soviet and the Romanian Governments. The latter manages the expropriated private and foreign interests, divided—for mere geographical convenience—into the "Muntenia" and the "Moldova" centurales. Together they account for some 68 percent of the crude output. The balance is managed by the Soviet Government, mainly through Sovrompetrol.

The rather ambitious production targets set for 1949 and 1950 were meant solely for the Romanian organization. They failed quite badly, however, because of lack of equipment, funds, technicians and skilled manpower. Besides, too much time

*General view of the Romanian oil town of Moreni in the Prahova Valley.*

had been wasted with reorganization schemes, and many an effort paralyzed by political interference. This failure became the object of a scolding piece of "self-criticism" in the Party's report of February 7, 1951 in which the mistakes were avowed and the incapacity confessed. Subsequently, the entire set-up was reshuffled, and the Fuel and Power Minister replaced. The greatest part of this public manifestation was, however, a show put on for the masses, in order to justify the seating of the Soviet managers. For, this act had long ago been prepared behind the scenes.

This was the moment when the Soviet Government took over the whole Romanian petroleum industry. Since then, all its operation phases are planned and directed by Soviet appointees, and its organization divided—according to Soviet models—into seven specialized trusts. The production is disposed of by the Russians who decide also the allocations for domestic consumption, and the little export sent to the other satellite countries, including China, is handled exclusively by Sovrompetrol according to the Soviet time-table of political priorities.

Since late in 1950, in the whole sub-Carpathian region there has been febrile activity going on. Some drilling has been done as far northeast as Campulung and Botosani (though also in search of gas and lignite), and as far southwest as Tg. Jiu and Mehedinti. Notwithstanding, the development activity is concentrated mainly in the Prahova and Dambovita districts, particularly in the known fields: Moreni-Piscuri, Tintea-Liliesti, Gura-Ocnitei, Ochiuri-Rasvad, Boldesti and Ceptura which continue to supply almost 80 percent of the current crude output.

Great hopes were held for the Teis-Targoviste formations which have been feverishly drilled since 1950. The well pressures seem to be decreasing rapidly as all gaslift wells have been recently changed to gas-saving Canadian pumping.

The surroundings of Tg. Jiu are also being drilled, but without any noticeable result. Finally, after some unrewarding drilling on the Banat structure as well as on that extending northwards from Arad, a somewhat reduced activity is being carried on in the Transylvania basin, where discoveries have been, so far, limited to new gas beds.

In spite of this activity no new formations of any importance have been discovered. The impression of great activity is conveyed by the great number of derricks and workers visible today in the Romanian oilfields. The output is, however, far from proportionate. A great number of the wells completed since 1949 are reworked or deepened wells. Almost all the wells closed down on the Moreni formation during the last 30 years are slated to be reopened. But the results here are also unsatisfactory: during a period of 14 months starting from early in 1949, only nine wells could be reactivated in Moreni, and their output is only two to six b/d. Further abandoned wells on the Urlati structure are being reopened, and even such depleted fields as Drumul Sarii are now being brought back to life.

After almost 40 years of lingering, the Bacau region now is coming back into the limelight. There are here, in all, 13 fields, of which seven were closed down long ago. The region's output may come, presently, close to 4,000 b/d lifted from over 600 wells, of which the best produces 46 b/d, and the poorest (peasants' pits) less than 0.5 b/d. This record output has been attained after most of the abandoned wells have been reopened, even those destroyed by the Romanian Army in 1916, during the retreat from the German advance.

In comparison with Western standards, the production methods applied now in Romania are utterly primitive, with the exception of the western block of Tintea Nord, where rational exploitation methods result in recovery of as high as 50 percent of the deposit's reserves. On all the other fields, the recoveries vary between eight and 25 percent. On the whole, at least 75 percent of the Romanian deposits remain undrained. Because of the high investments required, the problem of secondary recovery is, presently, only theoretically discussed.

In spite of official utterances to the contrary, the exploitation methods applied by the Russians tend to deplete the deposits even quicker than heretofore. No conservation is applied or envisaged. The proven reserves are crowded with wells.

During the last two years, great efforts have been made to introduce to all active wells the much discussed (Soviet) Crylov method which allegedly obtains a greater output. In fact, however, this method leads to a quick lowering of formation pressures by exhausting the gas in order to achieve a rapid movement of crude to the tubing. The certain result is thus a shortening of the primary recovery period.

The admitted general gas exhaustion brought into discussion the possibility of using Transylvania gas in the oilfields. A pipe line is to be laid to transport gas, at 450 psi., to the southern fields, with a branch to Tg. Jiu if any worthwhile discovery should be made there meanwhile. The Bacau formations, which have the lowest pressure of all, will be connected with the Transylvanian gasfields by 1955.

Equipment is very scarce, and what is available is either worn out or of a low quality. Since the Soviet "raids" of 1944, when 51,000 metric tons of pipe was seized, practically no materials and field equipment have been imported.

The expropriations of 1948 did not result, as expected, in a sudden abundance of material. At that time, on the southern fields alone no less than 75 types of pumps were counted. All were of foreign make for which no spare parts or blueprints were available. Much of the equipment formerly imported is now produced at home, but quite inexpensively. The metallurgical plants have not been modernized since 1939 and the items produced by them are a continual headache for the field operators. Pipes frequently crack, pumps fail, etc. These accidents waste labor and time and disturb production procedures. Many of the frequent mechanical failures are caused by breakages and jamming of rods produced at home.

The existing drilling outfits are old and their efficiency is officially rated at 40 to 50 percent of their potential. So far, Russia has sent only a few outfits for the Bacau development.

But the greatest difficulties are still ahead. The wells drilled or deepened in the southern region must go to over 9,000 feet. This requires a new type of heavy equipment which neither Russia nor Romania is presently producing. The steel used for tubing and drill pipe for such depths must be of a higher quality. The resulting high production costs will be further hiked by the decreasing drilling speed.

Finally, higher production costs are being caused by a disproportionate high employment. The administrative and political bureaucracy is tremendous. More manpower is constantly hired as a consequence of the lack of mechanization. The three- and four-shift system in most of the fields as well as the lack of trained workers adds to the problem.

Many employees are not even cursorily instructed how to use the equipment, it has been officially admitted. There is an utter lack of able technicians and training cadres and, in addition, the training school attendance is very poor. School buildings also are lacking. The qualifying school at Moinesti, for instance, was moved, during the first eight months of 1951, 13 times because of lack of premises. Dwelling facilities for workers are miserable or lacking altogether. Most of them are housed in distant villages or in homes from which the owners have been expelled.

An attempt to draw a balance sheet of the Romanian petroleum industry since the expropriation would show the figures in Table I.

The footage drilled during the past year was double the war-time peak of 1,029,000 feet in 1942. In this figure, however, was included also the footage drilled in search of gas, for reactivating and deepening old wells and for coal search.

The production results as indicated in Table II must be, indeed, very disappointing for the present regime.

A parallel decline in productivity is illustrated by the comparative figures in Table III.

The fall in productivity to almost one eighth of the 1936 level is indicative of the high production costs and hence more expensive crude. This renders understandable the official effort to make the workers toil for lower and lower labor rewards.

But the declining signs in the Romanian

*The oil town of Baicoi, Romania.*

petroleum industry are even more obvious when the situation is appraised by comparing the technical results shown in Table IV.

When speaking about the feasibility of the 1955 target, the present regime is taking comfort in frequently quoting the 1936 record output. While this may be used as an additional means of spurring the workers' effort, it may be safely assumed that no responsible technician presently in the fields, be he Romanian or Soviet, believes in the fulfillment of this over-ambitious target.

The parallel to 1936 is misleading because the sudden jump to 180,000 b/d in that year was due to the discovery of the Bucsani deposit which initially produced 45,000 b/d, but fell to a mere 1,800 b/d in 1944. The 1955 goal of 208,000 b/d must therefore be compared with a previous structural record output of only 135,000 b/d. The discrepancy thus is tremendous. The target of 75 million barrels set for 1955 must be discarded as fantastic.

At a first glance, the results for 1951 seem to have brought the declining trend to a halt. This is, however, a temporary achievement, due mainly to the output of the reactivated wells whose decline rate is more rapid than that of the other categories of wells.

At this point, it might be appropriate to recollect how sharply the nationalistic provisions of the Romanian mining law of 1924 were criticized. These allegedly restricted search and development activity through the small area of new concessions granted on State reserves. It was argued that the concessions were much too small to carry on a rational and profitable development. The successive mining laws of 1929 and 1937 partly remedied these shortcomings. Finally, the petroleum law of 1942 not only granted prospecting concessions of tens of thousands of acres but provided for compulsory unitization of the small concessions into big areas. Nevertheless the aggressive exploration policy carried on after 1937 failed to stop the natural decline in output.

Prior to the expropriation of private interests, the present Romanian regime and its Russian sponsors violently accused the foreign interests of having kept the Romanian oil industry rather as a closed workshop. It was charged that foreign companies slowed down production and refused to develop their accumulated reserves "for the benefit of their worldwide price manipulations and oil strategy." Since 1948, however, with but one master over all fields, the decline is continuing at the same rate, seven to ten percent a year.

The truth is that this decline is organic, thus not subject to remedies. Since 1935, no new region with an important and stable production like the earlier Ceptura, Ochiuri, Boldesti or Tintea has been discovered, and the limits of the exploitation zones could, thus, not be extended.

The future activity will, therefore, be confined by necessity to exhausting the known structures. Economically, this implies increasing investments and higher production costs in return for a decreasing production. The Romanian petroleum industry, obviously, has reached already the point of diminishing returns.

**TABLE I**

| Year | Drilling Goal (ft) | Actually Fulfilled | Index |
|---|---|---|---|
| 1948 | 1,050,000 | 998,054 | 95 |
| 1949 | 1,475,000 | 1,703,679 | 115 |
| 1950 | 2,130,000 | 2,001,669 | 94 |
| Planned | | | |
| 1955 | 4,100,000 | ——— | — |

**TABLE II**

| Year | Targets (Thousands of | Actually Produced Barrels) | Ratio |
|---|---|---|---|
| 1948 | 33,750 | 31,125 | 92 |
| 1949 | 38,362 | 32,400 | 84 |
| 1950 | 50,850 | 30,225 | 60 |
| 1951 | 60,150 | 36,750 | 61 |
| Planned | | | |
| 1953 | 64,600 | ——— | — |
| 1955 | 75,000 | ——— | — |

**TABLE III**

| Year | Production (Barrels) | Salary & Wage Earners | Production Per Capita (Barrels) | Index |
|---|---|---|---|---|
| 1936 | 62,280,000 | 25,580 | 2,552 | 100 |
| 1945 | 34,800,000 | 44,900 | 753 | 29 |
| 1947 | 28,575,000 | 57,400 | 500 | 20 |
| 1950 | 30,225,000 | 84,000 | 360 | 14 |
| 1951 | 36,750,000 | 105,000 (A) | 350 | 13 |

(A) An estimated total, including also manpower employed in the newly established tubing and pipe centers, repair shops, in the oil constructions, etc.

**TABLE IV**

| Year | Footage Drilled (Thous. Ft.) | Crude Output (Thous. Bbls) | Crude Output Per Foot Drilled | Index |
|---|---|---|---|---|
| 1936 | 987 | 65,280 | 66 | 100 |
| 1939 | 765 | 46,800 | 61 | 92 |
| 1942 | 1,032 | 42,487 | 41 | 62 |
| 1948 | 998 | 31,125 | 31 | 47 |
| 1949 | 1,703 | 32,400 | 19 | 29 |
| 1950 | 2,002 | 30,225 | 15 | 23 |
| 1951 | 2,300 | 36,750 | 16 | 24 |
| Planned | | | | |
| 1955 | 4,100 | 75,000 | 18 | 27 |

*Reforming unit at the new SARPOM refinery.*

# SARPOM SERVES INDUSTRIAL ITALY

ITALY'S FIRST large inland refinery will begin initial crude runs at San Martino di Trecate, Novara, within the next few weeks. The plant is the 15,000-barrel refinery of the Societa per Azioni Raffineria Padana Olii Minerali (SARPOM), an enterprise jointly owned by the Fiat Company and Caltex Oil Products Company. Operations are expected to commence during November of this year. However, formal inauguration of operations at the plant with official ceremonies has been postponed until the spring.

The new refinery was located in the center of Italy's most industrially developed area after careful studies by Fiat and Caltex. In the Piedmont and Lombardy regions of northern Italy the density of motor vehicles is much greater than in other parts of the country. There the ratio, exclusive of motorcycles, is one motor vehicle to 30 persons, compared with one to 70 in Italy as a whole. Industrial development offers a near-by market for fuel oils.

The plant is on the main railroad line between Milan and Turin at a distance of 20 miles from Milan. Its location has the effect of moving fuels for Po Valley consumers about 100 miles closer than the earlier supply point at Savona. Virtually all present refineries in Western Europe are located on the seaboard for convenient crude supply. Finished products, however, must be carried considerable distances. Under the plan developed by SARPOM, the crude will be pumped into the center of the marketing area in the Po Valley and the cost of transporting finished products reduced. SARPOM has installed unusually complete facilities for tank truck loading since the major part of the plant output will move to consumers by road transport. Twelve spots have been provided for the overhead loading of tank trucks. Due to the fact that the Italian Customs regulations require that shipping operations be confined to daylight hours, an elaborate system has been devised in order to expedite the execution of shipping formalities and to permit the maximum output being secured from the shipping facilities. A loading rack providing for the simultaneous filling of 18 tank cars has been constructed and two Diesel locomotives will be available for switching the full and empty tank cars between the refinery and the railroad yards located at the neighboring town of Trecate.

The refinery, on a 200-acre site, has a crude unit with a simple atmospheric distillation column capable of producing 400°F end point gasoline overhead with side cuts of kerosine distillate and blending stocks for automotive and heavy diesel fuels and a residual for inclusion in industrial fuel. A re-running unit with a capacity of about 5,500 barrels per stream day will be used to separate the straight-run gasoline into a 200°F end point light gasoline and a heavy naphtha for reforming. The thermal reforming unit with a charge capacity approaching 3,500 barrels daily of heavy naphtha will produce a 70 to 80 percent yield of high octane blending stock for motor fuel.

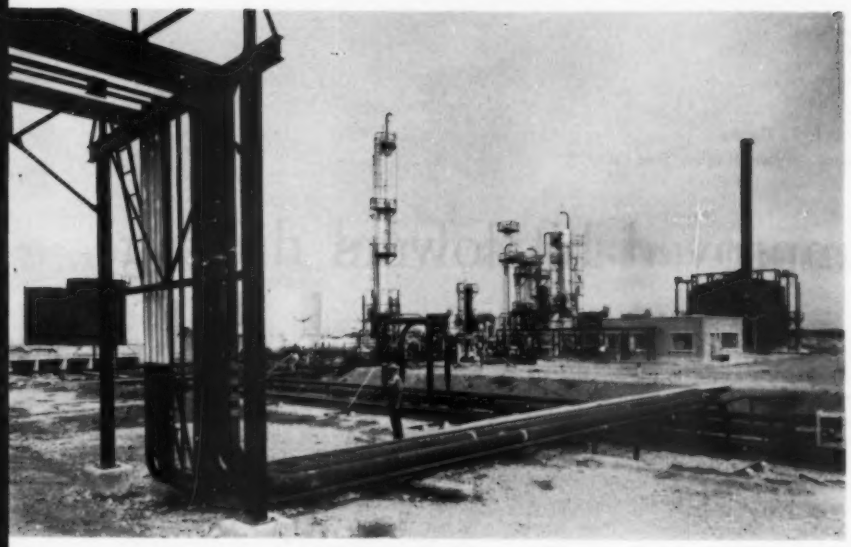
Chemical refining units include caustic treating for light gasoline, and a 4,500-barrel PbS sweetening plant. Inhibitor and TEL blending facilities are also provided. Kerosine is treated in a 1,200-barrel PbS sweetening plant. Water and steam supply, electric power distribution, and fire protection complete the refinery utilities.

Because of power rationing, which is periodically in force in the refinery area, it was necessary for SARPOM to provide for the extensive use of steam drivers on process pumps during such times as the consumption of electrical power must be curtailed. Two steam generators, each having a capacity of 70,000 pounds per hour of steam, have been provided in order to supply requirements under such conditions.

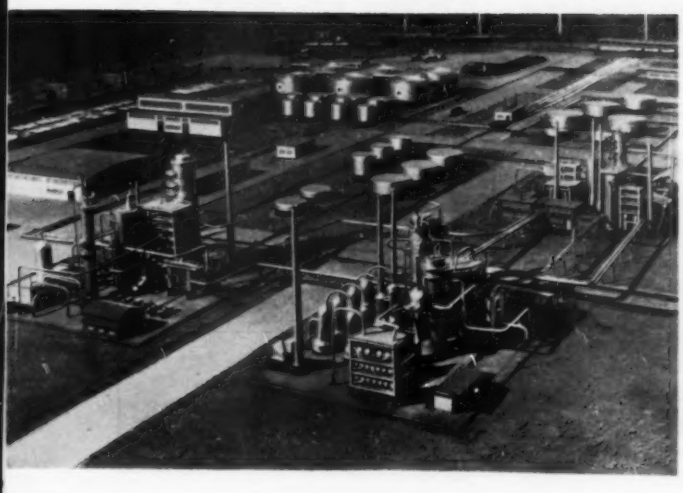
Although the refinery is on the banks of the Ticino river, SARPOM has found it necessary to resort to wells for its water supply. This plan was adopted because of the heavy demands on river water for irrigation. SARPOM drilled six water wells from which about 4,000 gpm can be pumped under maximum operating conditions.

*Some of the 66 river crossings on the Savona-Trecate pipe line were made by suspending the line on railway bridges as in the case of the Fiume Bormida pictured here.*

*Ornamental gate to the concrete pier at Savona terminal.*



*Marine terminal at Savona where tankers are unloaded and crude stored prior to pumping inland to Trecate.*



*Scale model of the SARPOM plant.*

Unusual care has been taken to prevent pollution of surface waters with plant effluent. Waste water is returned to underground sands rather than being permitted to enter the river. Eight water disposal wells of a design developed in Italy have been constructed for this purpose. Prior to injection into the disposal well, the refinery waste water is treated in an API oil separator system, consisting of three separate units designed for the segregation of the waste waters on the basis of the degree of their possible contamination with oily products. Oil recovered from this system is added to the crude stream and reprocessed.

E. B. Badger & Sons, Ltd., of Great Britain, handled most of the engineering design work and served as general contractors. Subcontracting has been given to different Italian firms. In the construction most of the purchase of materials and apparatus has been done in Italy, part in Great Britain, Germany, and the U. S.

Approximately 800,000 barrels of tankage for crude, partly refined and finished products will be provided at the refinery. Adequate storage for incoming crude also is available at the Savona marine terminal. The 200-acre plant site provides ample space for future expansion of tankage and other facilities.

Fiat has designed and erected plant buildings which include the administrative quarters, chemical laboratory, machine shop, stores building, cafeteria, shipping offices, boiler house, and four dwellings for supervisory personnel. The buildings are built to give the most efficiency and comfort to the personnel.

About 350 people will be employed at the refinery. SARPOM took particular care in the training of technical employees, many of whom have been sent to Bahrein and to the Bec d'Ambes (Bordeaux, France) refineries of the associated companies for some months of practical work. The SARPOM refinery will be operated entirely by Italian personnel, although a start-up crew from Bahrein was brought in to supervise initial runs.

Railroad connection has been built to the Milan-Turin line and the nearby road for trucks has been widened and paved by the company. The location chosen for the refinery required an efficient solution to the problem of crude supply from the Middle East. At present, Middle East crude is shipped by Trans Arabian pipe line to Sidon, Lebanon and thence to Italy by tankers.

The Petrolcaltex company previously operated a marine terminal at Savona, 28 miles west of Genoa, for the importation and storage of petroleum products. This has been enlarged and revamped for the handling of crude cargoes. Storage capacity at the terminal has been increased to 220,000 barrels.

First cargo of crude for the new plant was received from a 50,000-barrel tanker of relatively shallow draft which was able

*(Please turn to page 122)*

*Fig. 1. Bottom view of 8¾-inch bit.*

**By Lyle L. Payne**
Chief Engineer, Hughes Tool Co.

# Improved bit lowers drilling

IN RECENT YEARS the search for deeper producing zones has introduced the serious problem of penetrating extremely hard and abrasive formations. Typical examples are the Devonian chert of West Texas or the bromides of Oklahoma. These formations cannot be economically drilled without applying adequate load on the bit to establish a destructive chipping-crushing action as the cutting surfaces rotate on bottom.

The problem of fortifying the cutting and gage surfaces of rolling cutter rockbits to better withstand abrasive wear encountered in many formations has been recognized from the year 1909. From this date until 1929, rock bit manufacturers depended entirely upon a carburized cutter to resist abrasive wear encountered in rotary drilling. Although periodic improvements in design materially increased the footage per bit and penetration rate, the abrasion problem was still unsolved.

During the year 1929, granulated cast tungsten carbide was first applied to the flanks of cutter teeth and the gage cutting surface. This material is extremely hard and highly resistant to abrasive action. Rock bits having an overlay of cast tungsten carbide applied to the cutting surfaces recorded marked improvement in performance, particularly in drilling abrasive formations of medium to low strength. The advent of tungsten carbide, in combination with improved metallurgy, alloy steels and design, has been a major factor in the widespread use of rotary drilling.

The cast tungsten carbide application on the tooth flank of hard formation rockbits, such as the W7R, is not effective in drilling extremely hard, abrasive materials which require heavy weight applied on the bit. Although this form of carbide is extremely hard and resistant to abrasion, it is also very brittle. This latter physical property limits its effectiveness as a protective overlay on hard formation rockbit cutter teeth when drilling formations under consideration.

Sintered tungsten carbide has been used on metal cutting tools for many years. This material is almost as hard as the cast carbide, and has the desirable property of being much less brittle than the cast form. Recognition of its great resistance to abrasion and its compressive strength in excess of 500,000 psi justified an extensive research program to utilize sintered tungsten carbide for rockbit cutting elements.

During the past twelve years numerous attempts were made to use the sintered form of carbide on rockbit cutters. The carbides available during most of this period did not have the physical properties required for successful application on rolling cutter rockbits. Over the past few years sintered carbide manufacturers have developed remarkably tough grades for sustaining high-impact stress and still retaining high resistance to abrasion. This program, spurred by the desire to reduce the high cost of drilling chert, chert-bearing lime or dolomite, and hard, quartzitic formations, has led to the development of the Hugheset type R-1 rockbit. Figures one and two are a bottom and side view of the 8¾ inch type R-1, and show three conical cutters studded with hemispherical-ended cylinders of sintered carbide. The application of carbide cutting elements as represented by this bit has been field proven over the past two years.

The R-1 bit has given remarkable performance in the hard, abrasive, cherty sections of West Texas and New Mexico, and the hard quartzitic formations of Oklahoma and the Rocky Mountain areas. It is not unusual for one R-1 bit to drill three to ten times the footage normally obtained with regular hard formation rockbits in these hard, abrasive formations. The drilling rate will equal that of regular bits, and in some cases has exceeded the rate of regular bits by 50 to 100 percent.

The R-1 may be called a "spot" bit, but its application has been very rewarding in those localities where the "spots" are fairly well established. Experience has shown that not all formations classified as "hard abrasive," in which regular bits give relatively short runs, are economically drilled by the type R-1. Certain sandstones, which have relatively weak binders, and some hard, abrasive shales have not responded to the crushing action of the R-1 cutting structure. Apparently these formations, in place, must be somewhat plastic and are not friable. Field tests are necessary in determining the suitable formations for the R-1.

Tables 1, 2, and 3 were compiled from bit performance records and show the average performance of the R-1 compared to the regular W7R. Referring to Table 1, the average of 128 R-1 bits run and 89 W7R bits run in the same formation shows the R-1 has a footage ratio of 4.1 and a penetration ratio of 1.1.

Table 2 lists a limited number of runs.

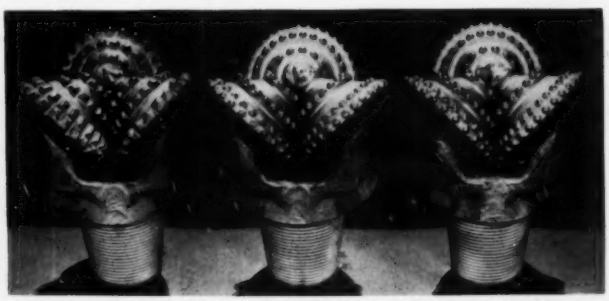


*Fig. 2, left. Side view of R-1 bit with hemispherical ended cylinders of sintered carbide. Fig. 3, right. Condition of bits after drilling services shown in Table 4.*

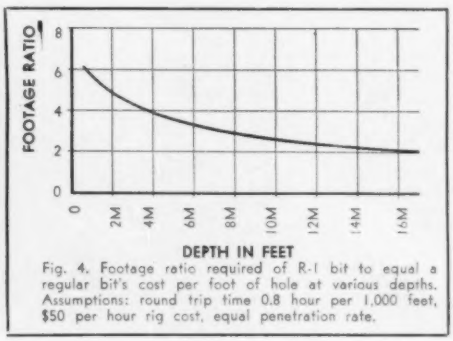



Fig. 4. Footage ratio required of R-1 bit to equal a regular bit's cost per foot of hole at various depths. Assumptions: round trip time 0.8 hour per 1,000 feet, $50 per hour rig cost, equal penetration rate.

# cost in hard abrasive formations

However, the R-1 footage ratio is 3.6, and the speed ratio is 1.1.

Table 3 lists comparative runs made in Oklahoma, and the average R-1 footage ratio is 2.9. The speed ratio is 1.4.

Table No. 4 lists part of the bit performance record of a well drilled in Upton County of West Texas. The formation was Devonian lime and chert. The two R-1 runs, compared to the W7R, established a remarkable average footage ratio of 15 and a penetration speed ratio of 3.2.

The condition of the three bits listed in Table No. 4 is shown in Figure 3. The cutting teeth and gage surface of the W7R had served their useful life. The bit is well worn. The R-1 bits show moderate carbide breakage, but no appreciable wear off those compacts which are not chipped or broken. The R-1 bits were pulled on the basis of relatively long rotating hours.

It has been found that the best operating practice in drilling chert or chert bearing limestones is to carry weight on the bit of approximately 4,000 pounds per inch of bit diameter, with a rotary speed of approximately 35 rpm. Extremely heavy weights in the range 5,000-6,000 pounds per inch of bit diameter are not necessarily economical. Weight applied on the R-1, in excess of that required to establish effective chipping-crushing action on the formation, may materially reduce bearing life and also cause more breakage of the sintered compacts. A compromise applied load and a relatively slow rotary speed will normally establish very smooth operation of the bit, which is highly beneficial to long bearing life, and consequently results in more footage per bit. The sintered carbide wears at a very slow rate and will maintain the initial penetration rate over a long period. Apparently only enough weight on the bit sufficient to effectively crush the formation is an optimum practice.

In certain instances the R-1 has been used in drilling a cherty dolomite with an applied bit load in the range 500-1,000 pounds per inch of bit diameter. The R-1 footage ratio and speed of penetration ratio, compared to the W7R, were very satisfactory.

In some cases it may be necessary to ream an undersized hole before reaching bottom with the R-1. Such reaming should be performed under careful control to avoid imposition of large inward thrust forces which may cause breakage of the gage-cutting, sintered compacts. It is recommended that reaming be performed at a controlled rate and not exceed ten feet per hour. Furthermore, it is advisable to periodically check the applied torque by disengaging the rotary table drive clutch. Excessive "wind-up" of the drill stem indicates the bit is not reaming freely, and the drill stem should be raised to permit re-reaming at a slower rate. In reaming an appreciable footage of extremely hard, abrasive formation the bit may become undersized and would, upon reaching bottom, drill undersized hole. Such cases may warrant a round trip to change bits in order to drill ahead with a full gage bit.

**TABLE 1**

WEST TEXAS AND NEW MEXICO

| Size Bit | Bit Type | No. Bits Run | Total Footage | Total Hours | Average Ft. per Bit | Average Ft. per Hr. | Ratio of Footage | Ratio of Speed |
|---|---|---|---|---|---|---|---|---|
| 7 7/8" | R-1 | 9 | 442 | 162.75 | 49.11 | 2.72 | 5.0 | 1.6 |
| 7 7/8" | W7R | 9 | 88 | 52.00 | 9.78 | 1.69 | | |
| 6 5/8" | R-1 | 2 | 104 | 56.75 | 52.00 | 1.83 | 5.5 | 1.5 |
| 6 5/8" | W7R | 2 | 19 | 16.00 | 9.50 | 1.19 | | |
| 6 3/4" | R-1 | 14 | 809 | 309.83 | 57.79 | 2.61 | 4.0 | 1.1 |
| 6 3/4" | W7R | 12 | 174 | 70.50 | 14.50 | 2.47 | | |
| 8 1/2" | R-1 | 2 | 105 | 38.75 | 52.50 | 2.71 | 6.6 | 1.9 |
| 8 1/2" | W7R | 1 | 8 | 5.50 | 8.00 | 1.45 | | |
| 8 1/4" | R-1 | 101 | 7,695 | 2,863.25 | 76.19 | 2.69 | 4.1 | 1.0 |
| 8 1/4" | W7R | 65 | 1,245 | 464.75 | 19.15 | 2.68 | | |
| All Sizes | R-1 | 128 | 9,155 | 3,431.33 | 71.52 | 2.67 | 4.1 | 1.1 |
| | W7R | 89 | 1,534 | 608.75 | 17.24 | 2.52 | | |

**TABLE 2**

ROCKY MOUNTAIN

| Size Bit | Bit Type | No. Bits Run | Total Footage | Total Hours | Average Ft. per Bit | Average Ft. per Hr. | Ratio of Footage | Ratio of Speed |
|---|---|---|---|---|---|---|---|---|
| 9" | R-1 | 4 | 162 | 43.50 | 40.50 | 3.72 | 3.6 | 1.1 |
| 9" | W7R | 3 | 34 | 10.50 | 11.33 | 3.24 | | |

**TABLE 3**

OKLAHOMA

| Size Bit | Bit Type | No. Bits Run | Total Footage | Total Hours | Average Ft. per Bit | Average Ft. per Hr. | Ratio of Footage | Ratio of Speed |
|---|---|---|---|---|---|---|---|---|
| 9" | R-1 | 11 | 530 | 229.78 | 48.18 | 2.31 | 2.9 | 1.4 |
| 9" | W7R | 11 | 183 | 106.76 | 16.64 | 1.71 | | |

**TABLE 4**

| Size Bit | Type | Depth | Ft. | Hrs. | Ft. Hr. | Weight on Bit | RPM |
|---|---|---|---|---|---|---|---|
| 8 3/4" | W7R | 11,789 | 8 | 6 1/2 | 1.23 | 35,000 | 40 |
| 8 3/4" | R-1 | 12,922 | 133 | 31 | 4.29 | 40,000 | 35 |
| 8 3/4" | R-1 | 13,030 | 108 | 30 | 3.60 | 35,000 | 35 |

The greater footage obtained in suitable formations has paid handsome dividends by reducing round trips, thereby saving rig time and wear on equipment. The curve shown in Figure 4 will give an appreciation of this result. Under the assumed conditions, we calculated the footage ratio required of the R-1 to equal a regular bit's cost per foot of hole drilled at various depths. A brief study of this curve shows the R-1 will lower drilling cost in suitable formations even at moderate depths, but particularly in deep drilling.

Continuing research and development is under way directed at further improvement of the present R-1 design, and to extend the basic principle of the R-1 into modified designs for drilling other abrasive formations of moderate strength.

# THE POWDER RIVER BASIN

By Tom Dougherty
Staff Writer, Petroleum Information, Denver-Casper.

THE POWDER RIVER basin of Wyoming and Montana was the cradle of the Rocky Mountain oil industry. Sixty three years of production from its fields have accounted for a major portion of all oil produced in Wyoming.

Powder River basin oil made Casper, Wyoming the oil capital of the Rockies in the early days when production was brought to Casper refineries and railhead behind 20-horse teams. Continued discoveries and the major character of some of the early finds have kept the basin ascendant on the Rocky Mountain oil scene and have maintained the position of Casper and Wyoming through the years which have seen other areas arrive at major prominence.

Teapot Dome, a name known to every schoolboy, and the Salt Creek field, one of the 15 largest total producers in the nation, have insured perpetuation of the Powder River basin, both in fame and notoriety.

Despite the long period of successful operations in the basin, recent discoveries of major importance and the relatively large undrilled areas have emphasized its stature as an area of more promise and more surprises than most of the region's other older oil producing areas.

Powder River is second in size among Rocky Mountain structural basins, and is exceeded in area only by the Williston basin of recent importance, to which it lies tangent on the northeastern border. It lies along the eastern fringes of the Rocky Mountains and is simpler than the more deformed intermontane basins to the west.

The southern extremity of the basin is a wedge-shaped area lying between the northern terminus of the Laramie Range on the southwest, and the Hartville Uplift on the southeast. The western boundary follows the line of Pine Mountain folding west of Casper, the eastern flank of the Big Horn Mountains to Montana, then east of the plunging flank of the Pryor Mountains to terminate at the Big Snowy anticlinorium in central Montana.

The northeastern edge of the basin lies roughly along the west side of the Baker-Glendive anticline, then through the folding north of the Black Hills. The Black Hills themselves form the eastern boundary.

At least three of the older oil fields of the Powder River basin were major influences in Wyoming's emergence as an important oil producing state and were of a caliber that aroused interest in the entire Rocky Mountain region.

All three of these fields of early major importance are still important producers. Salt Creek leads Rocky Mountain fields in total production, and both Big Muddy and Lance Creek also rank high in total oil produced.

First recognition of possibilities of oil production in the basin came in 1882 with the filing of placer claims on the S½ SW 13-40N-79W by Cy Iba, prospector and latter-day mountain man who was an intimate of Cimineau LaJeunesse, Bridger, Boney Earnest, and others of the well known trappers and explorers. Iba's claim centered on a live-oil spring in the bed of Salt Creek. Wyoming's territorial geologist, Samuel Aughey, who visited the site in 1884, noted that "at least 20 barrels of oil had accumulated in the creek bed."

Iba's filing became famous throughout the Rocky Mountain region as further operations at Salt Creek proceeded, and became known as the "Iba Eighty," perhaps the most widely known oil producing small tract in the west. Iba's only reward for

his early work and his switch from gold to oil prospecting was an abiding place in the history of the area. He died before seeing the fruits of his belief that oil accumulations of value were to be found on his claims.

The first well was drilled at Salt Creek in 1889. There is very little record of it except that some oil was bailed from the hole. Showings in this well and seeps on the northern end of the structure led to the location of P. M. Shannon's first well in SE 36-41N-79W. In 1891-92 Shannon's group drilled 13 wells to depths ranging from 600 to 1,000 feet, in what became known as the Shannon pool on the north end of the Salt Creek structure.

First Wall Creek (Frontier) sand production, which might be termed the original discovery within the field proper, was found in a well drilled in 1908 by Petroleum Maatschappij Salt Creek du Wyoming. In 1917 production was found in the Second Wall Creek, and in 1921 Lakota was added to producing horizons at Salt Creek. Deeper production in Morrison and three benches of the Sundance was found in 1925 and 1926. Tensleep production was not discovered until 1930. Of these producing horizons, Second Wall Creek is of primary importance and is credited with two thirds of the oil produced at Salt Creek. The field has produced nearly 345 million barrels and at one time had a daily production of more than 100,000 barrels.

The Big Muddy field, 20 miles east of Casper on the southwest margin of the basin, was discovered in 1916 with a completion in Shannon for an initial of 26 barrels per day. Wall Creek production followed in the next year, and in 1922 Dakota and Lakota sands were found productive. This field has produced more than 30 million barrels of oil.

The Lance Creek field in west central Niobrara County, about 25 miles west of the Nebraska line, is the third major field in the basin which contributed to the early importance of the Powder River basin and which is still producing an important volume of oil. Lance Creek was discovered by The Ohio Oil Co. with a well in section 36-35N-65W. Initial completion was in First Wall Creek sand, and the well was later deepened to Dakota for an initial of about 1,500 barrels daily. A flurry of drilling followed the discovery, but died out by 1921 because of poor results. In late 1930 Ohio discovered oil in Upper Sundance and in 1935 the company made an important discovery in the basal member of this formation. The first Basal Sundance well produced more than 2,000 barrels per day on initial test.

In 1936 Ohio made an important new-pay discovery in Minnelusa (Pennsylvanian) with initial production 1,250 barrels daily. The development program which followed to Sundance and Minnelusa was a leader among Rocky Mountain programs at that time. The Lance Creek field has produced more than 33 million barrels of oil to the present time.

There was considerable exploration and study of the eastern and northeastern portions of the basin within Wyoming during the period which saw discovery of Big Muddy and Lance Creek, but no spectacular results were noted. The eastern flank of the basin produced oil in 1919 at the Osage field, located in township 46 north, ranges 63 and 64 west, in Weston County. In contrast to the well-developed structures of the fields previously mentioned, the Osage field occupies part of a gentle terraced monocline which dips westward

from the general region of the Black Hills.

The eastern portion of the basin is characterized by reduced structural severity in comparison with west side areas, and other later fields on the eastern side have been somewhat similar to Osage. This field was heavily drilled by independents, with production from shallow wells in the majority of the field area. Crude was processed locally, for local and district sale in most cases.

Production at Osage is from the Newcastle sand of Upper Cretaceous age which corresponds to the Muddy of other Wyoming areas.

These fields set the pattern of discoveries around the rims of the Powder River basin, and with but few exceptions were the principal achievements of oil operations within the basin until the 1940's. The Cole Creek field southeast of Salt Creek and Teapot Dome, and also in Natrona County, was a notable exception. It was discovered in 1938 by General Petroleum Corporation following both surface and extensive seismic work, and was the first basinward field heavily buried under Tertiary deposits. Discovery followed a surge of heavy leasing activity in which upwards of three quarters of a million acres were assembled into approximately 15 blocks by several individuals and companies.

Earlier, of course, discovery of oil in Teapot Dome immediately south of Salt Creek had resulted in production of more than three million barrels of oil from the famous structure before it was shut in during 1926 following the scandals surrounding its administration as a Naval Petroleum Reserve.

The flush and frenzied era of oil production and exploration for new fields in the Powder River basin dated from 1916 and persisted into the late 1920's. At the conclusion of the '20's changing market conditions and the end of flush production at Salt Creek staggered the Rocky Mountain oil industry, and it remained in a much curtailed and semi-active state for nearly 20 years. Only a few of the major companies remained in the area during this period, and the only major developments have been previously noted in discussion of the several important fields.

At the bottom of the region's difficulty was the lack of competitive transportation to consuming areas outside the region itself. In the absence of demand for the light oils of the southern Powder River basin, the heavy black oils of the fields then producing in the Big Horn basin and some other areas of the state were even more definitely restricted as to market.

With the resurgence of interest at the beginning of World War II, the major companies operating in the region, and particularly in the Powder River basin, planned steps which would prevent a recurrence of the loss of competitive position for the Rockies in the oil markets of the country. These plans finally came to fruition in 1951 with the banding together of five companies in the formation of the Platte Pipeline Co. which is now engaged in laying the final links in a 1,100 mile line from the Big Horn basin through Casper to Wood River, Illinois.

The early 40's marked the beginning of a wholesale re-entry of both major and independent operators into the region, and to the Powder River basin, particularly in the early stages of the revival of regional activity.

Operations were necessarily restricted in the war years, but immediately following the end of the war, interest was renewed, activity gained momentum and has continued to progress through a series of important and sometimes surprising developments to the present all-time high level in the Powder River basin and indeed throughout the region.

The first significant post-war development in the basin was the discovery of oil in the Mush Creek field of Weston County by the Morton Drilling Co. of Casper. The area produced several other fields in quick succession as a result of the drilling spurred by the Mush Creek discovery. Skull Creek, Fiddler Creek, Hay Creek, Lodgepole and Clareton were especially active during 1946, the year of discovery for most of these fields and the following two years. A considerable amount of both wildcat and development drilling is still under way in the area.

Development of these new Weston County areas followed the pattern set earlier at Osage. Independents did the majority of the work, although the Texas Company, Continental Oil, Union Oil Company of California and a few other larger operators were also active in leasing and some development work. Contrary to the older pattern of transportation and marketing, gathering in these fields and primary transportation to larger line junctions is done by the Plains Pipeline Co.

In 1948 Continental found production in a wildcat northeast of the Salt Creek-Teapot Dome area in southern Johnson county which touched off a development and exploration program which became the most active and rewarding in the Rocky Mountain region until the discovery of oil in the Williston basin in early 1951.

Continental's successful wildcat at Sussex was completed in Lakota and was the first of a series of wells which opened the entire Sussex-Meadow Creek area. Since the discovery well, over 200 wells have been drilled in the two fields and seven distinct pools with production from five different formations have been established. Shannon, Sussex, Frontier, Lakota, and Tensleep sands are all productive within this trend which extends some 15-18 miles in a northwest southeast direction, northeast and considerably basinward of the Salt Creek area. The Tensleep discovery, made in the Sussex field, came in 1951, and was later repeated in other Sussex areas and in the Meadow Creek field to the south.

Initial potential of the Tensleep discovery from a thick (117 foot) saturated section was 1,400 barrels daily. Later Tensleep wells have also made good showings and early development indicates a sizeable reservoir from this formation.

Tensleep production at Salt Creek is of considerably less areal extent than the other important horizons. In the Sussex-Meadow Creek areas indications are that the Tensleep reservoir covers a rather extensive acreage, although the present stage of development is not sufficient for accurate determination.

Production of oil from this formation in the Sussex-Meadow Creek area is of great importance to the future of the basin. Except for Salt Creek and the Lance Creek-East Lance Creek-Little Buck areas of Niobrara County, and one small deep producer in the Adon area of Campbell County, Tensleep had not previously been productive in the basin. Since the discovery of Tensleep oil at two Sussex areas and at Meadow Creek, new discoveries in the formation have been made at North Fork in the Kaycee area of Johnson County and within the Teapot Dome Naval Petroleum Reserve.

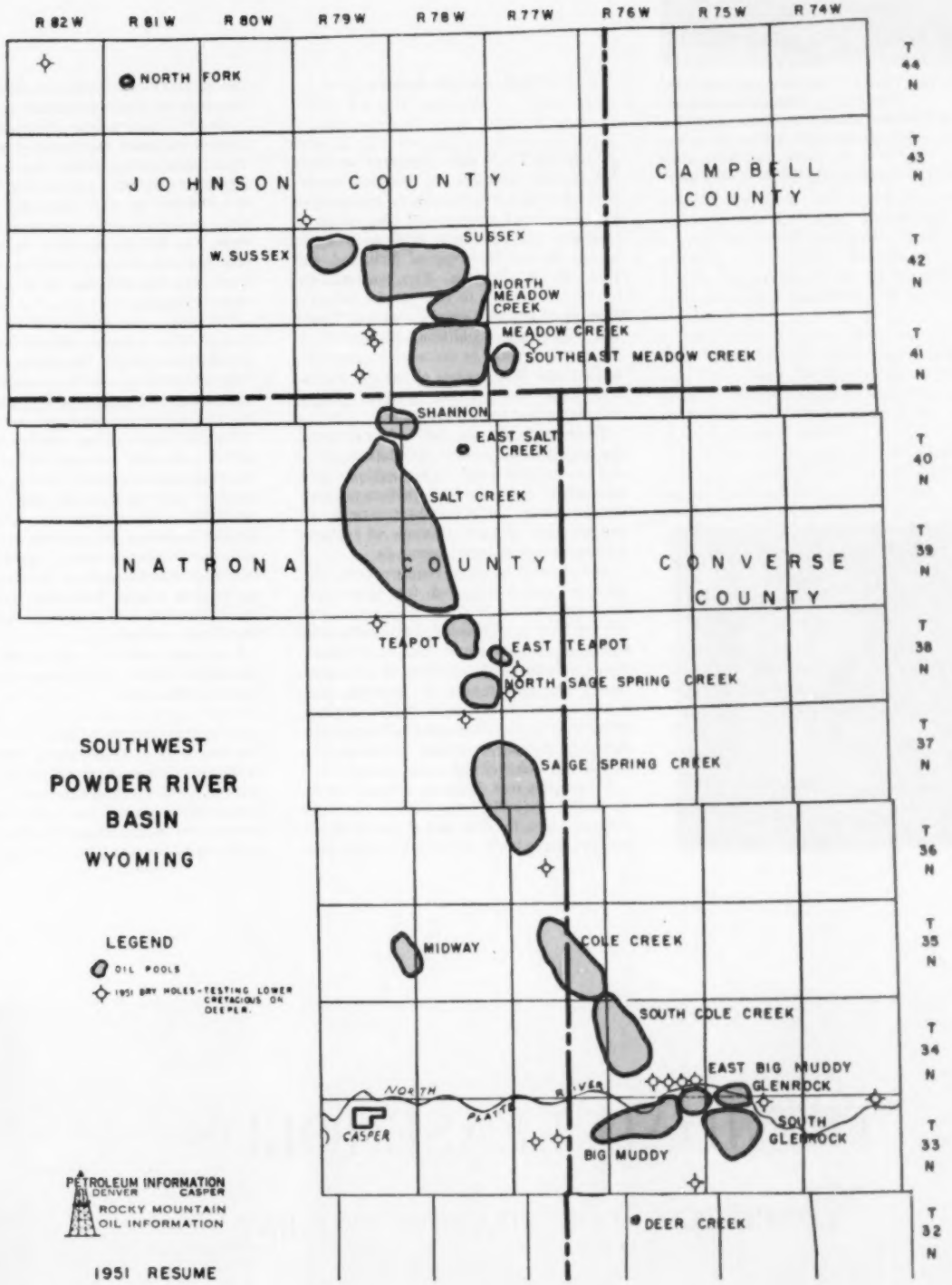
Stanolind Oil & Gas Co. drilled the North Fork discovery in 1951, and the wildcat in C SW SW 19-44N-81W was completed for approximately 175 barrels daily after earlier tests indicated a much higher potential. On the basis of the one well and geological information at hand it is estimated that recoverable reserves from this discovery may run as high as 10 million barrels.

The discovery on the Naval Reserve was made in 1951 in the first drilling done within the reserved area since the field was shut in 26 years ago. The Tensleep discovery was drilled to basement rocks and was the first well in the field to penetrate all potential producing zones. Apparently commercial shows were also obtained from Muddy sand in this well. Operations projected for the reservation included two, possibly three, deep tests for further evaluation of the structure.

Immediately east of Teapot Dome and a similar distance east of the Salt Creek field, discoveries were made in 1951. Trigood Oil Co. of Casper drilled the East Teapot discovery well, and Sinclair Oil and Gas Co. made the discovery at East Salt Creek. In the latter field production was found in both Frontier (Wall Creek) and Lakota sands. The company proceeded immediately with development and evaluation drilling and now has more than five wells on production. The discovery well was completed as a dual producer. The East Teapot area had four wells in production at the end of 1951. South of Salt Creek and Teapot, and along the same trend, discoveries were made in 1949 at Sage Spring Creek and still further south at South Cole Creek. Development programs are active in both areas.

In the East Big Muddy and Glenrock

*(Please turn to page 114)*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EAST SALT CREEK
SALT CREEK
NATRONA COUNTY
CONVERSE COUNTY
TEAPOT
EAST TEAPOT
NORTH SAGE SPRING CREEK
SAGE SPRING CREEK
MIDWAY
COLE CREEK
SOUTH COLE CREEK
EAST BIG MUDDY
GLENROCK
NORTH PLATTE RIVER
CASPER
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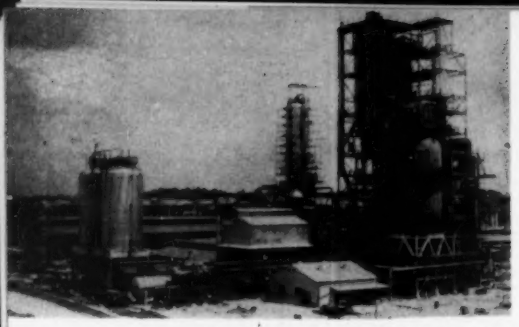
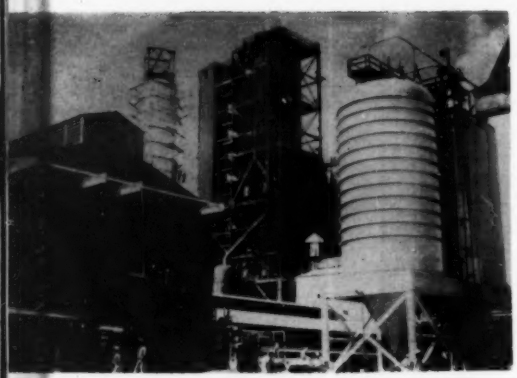
PETROLEUM INFORMATION
DENVER CASPER
ROCKY MOUNTAIN OIL INFORMATION
1951 RESUME





*Two views of the new fluid cat cracker installed by Trinidad Leaseholds. The view above is from the southeast. The photograph below was taken from the southwest. Both were taken in June before the unit was completed.*

# TRINIDAD LEASEHOLDS

## COMPLETES MODERNIZATION PROGRAM

**By E. Lawson Lomax**

COMPLETION of a two-year modernization program at Trinidad Leaseholds' Pointe-a-Pierre refinery was marked by the official opening of the catalytic cracking unit of 15,000 bpsd on July 30 by the Acting Governor of Trinidad, the Hon. P. M. Renison. The western refinery was erected in 1940/41 for the production of aviation spirit. During World War II extensive additions were made to the existing plant to increase its capacity while under the auspices of the Air Ministry. After the war this western refinery was purchased by the company.

The combined refineries, before modernization, included crude distillation, thermal cracking and reforming, sulfuric acid alkylation, isomerization, polymerization and associated units for the treatment of products and the manufacture of sulfuric acid and other process chemicals.

For modern market requirements, the refinery was unbalanced for economical running, and so in 1949, a scheme was worked out by Trinidad Leaseholds and Universal Oil Products Co. of Chicago, which involved the addition of new processes, the re-vamping of existing processes, their integration with the existing refinery at La Carriere and the former Air Ministry refinery, together with addition of utilities to service the new equipment.

The scheme was designed with a view to rendering the refinery a modern and economical plant for the manufacture of all petroleum products except lubricating oils and asphalts which are not manufactured presently by Trinidad Leaseholds.

Foster Wheeler, Ltd. of London was appointed as main contractor for the new units, with responsibility for detailed engineering design, purchasing, shipping and erection on site. The staff of Trinidad Leaseholds was responsible in the same way for the services in connection with the re-vamping of the existing equipment and the addition of the necessary utility services.

The main units of the new construction consist of a vacuum distillation unit of 24,500 bpsd capacity for catalytic cracking feed preparation, a fluid catalytic cracking unit, gasoline treating unit and a gasoline re-run unit for the catalytic gasoline.

The re-vamping and addition of utility services involved the conversion of one thermal cracking unit into a combined topping and visbreaking unit, and the modification of another for visbreaking asphalt produced as bottoms in the new vacuum distillation unit. Improvements in the existing residuum flashing system are to give greater flexibility, and also to handle the blending of vacuum pitch when this is not cracked.

Increased efficiency was sought in the recovery of light hydrocarbons in the gas fractionating systems of the existing thermal cracking and reforming units. An additional hydrogen sulfide recovery system has been installed, from which some 6,000 tons per year of sulfur will be recovered. The thermal reforming unit gas fractionation system has been re-vamped to carry out the fractionation also of gases produced in the catalytic cracking unit.

The modifications and additions to the plant services include a new induced draft water cooling tower, a new Foster-Wheeler three-drum type steam generator, considerable changes in the electrical distribution system and additional storage tanks and interconnecting pipe lines.

The first main unit in the new construction side to be completed, in April 1950, was the single column vacuum distillation unit for the distillation of topped crude and producing vacuum gas oil, slop wax and asphaltic bottoms. From first order for equipment to coming on stream, the construction time of this unit was 24 months.

The 21-foot I. D. fractionating column for this unit was field fabricated of Colclad steel giving an internal lining of 7/64-inch of 13 percent chromium as a protection against corrosive crudes. It is fitted with eight alloy bubble decks and two alloy side to side fans. The 30-inch I. D. transfer line is also made to Colclad steel.

An existing superfluous reforming unit gas fired heater was dismantled, revamped and re-erected as heater for the vacuum unit. Vacuum is maintained by a two-stage steam ejector with a jet type intermediate condenser. Waste heat from the vacuum gas oil is utilized to raise steam at 200 psi and to preheat the charging stock.

The catalytic cracking unit designed by Universal Oil Products Co. has an elevated reactor and pressured regenerator, the silica-alumina catalyst used being in micro-spheroidal form. Products from the unit are catalytic gasoline, light and heavy catalytic cycle oil and gases containing $C_3$ and some of the lighter hydrocarbons.

The reactor, regenerator, main fractionating column and catalyst storage hoppers were shipped as plate, assembled in sections and then lifted into position.

The largest of these vessels, the catalyst regenerator, is 31 feet 8 inches I.D., and 39 feet long, having a 7/8 inch wall and a 4-inch monolithic heat-resisting concrete lining, and is fitted with six two-stage cyclones for catalyst recovery from flue gases.

The reactor is 23 feet I.D., and 35 feet long with a wall thickness varying from 1¼ inches at the top to 1 9/16 inches at the bottom. After erection, it was stress relieved, hammer tested and hydrostatically tested, using hot gases from the air preheater of the cracking unit to provide the necessary heat for stress relieving. Five single cyclones are installed in it for separation of catalyst from the hydrocarbon vapors.

The 14-foot I.D., 97-foot long main fractionating column has the lower 43 feet and bottom head fabricated from Colclad steel, while the 21 bubble decks and six discs and doughnut pan assemblies are fabricated of 12 percent chrome steel.

With the exception of the waste heat boilers, large 4/6 chrome catalyst piping, large expansion and hinged joints, and the refractory lining for the regenerator, all the major equipment for the unit was fabricated by British manufacturers, in some cases to American detailed drawings.

The catalytic gasoline is split in a new fractionating column into light and heavy gasolines, thus allowing separate treatment of each quality. This column of 3,000-barrel capacity is designed for vacuum operation.

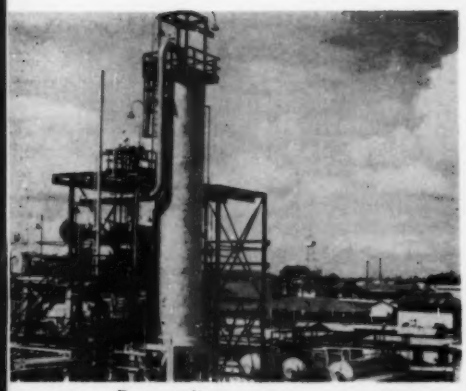
The gasoline treating, caustic washing and re-running units are of conventional design.

Owing to the large amount of on-site welding required, an extensive welder-training program was inaugurated and some 60 local employees were trained to do satisfactory first-class welding to API/ASME requirements, to which code all vessels in the refinery plant were constructed.

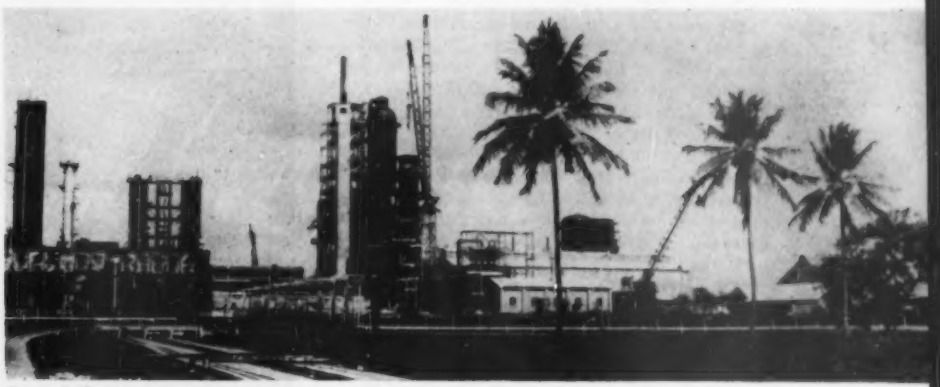
During the course of the work on the main units, the staff included six American top supervisors for the main contracts, some 50 British overseas supervisors, local craftsmen and labor bringing the peak number to about 1,050.

In order to keep dollar expenditure to a minimum, most of the material was purchased in Great Britain, only about eight percent of the total value being purchased in the United States. Total U. S. expenditure, including charges for design, erection and materials, amounted to less than eight percent of the erected cost of the work.

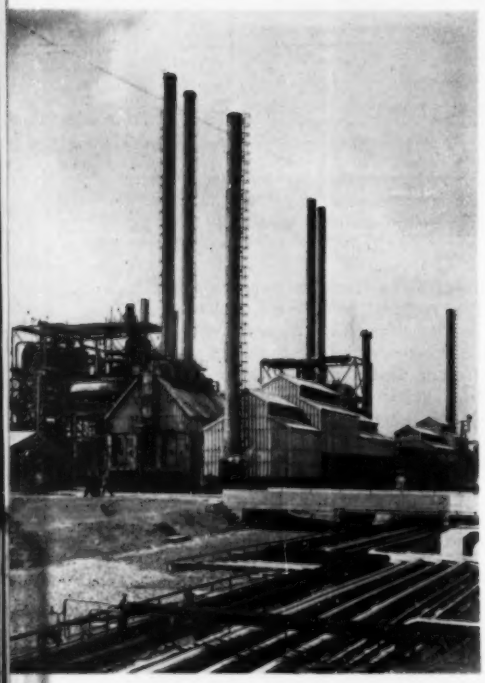
Trinidad Leaseholds, Ltd. and the California Texas Oil Co. Ltd. each supply a 50 percent share of the Regent Oil Company's requirements for the United Kingdom market. The Caltex refinery at Bahrein already has a cat cracker in operation which was built during the last war, so the completion of the Trinidad project will put both of these supplying companies in a position to supply the highest grades of products to the Regent Oil Company for the United Kingdom market.



*Rerun unit.*



*General view.*



*Heaters and primary separation equipment at Wilton petrochemical plant.*

The main cracking takes place in the section where the superheated steam and naphtha vapors mingle before reaching the quench boilers, where, by the admission of steam, the temperature is quickly lowered below that at which further cracking can take place. The mixed vapors then pass to the fractionation column.

Effluent tail gas, mainly hydrogen and methane, is utilized for ammonia manufacture or creosote hydrogenation at Billingham. Mixed olefin gaseous hydrocarbons are separated in the gas distillation plant. Other products are a small quantity of heavy fuel and crude unsaturated motor spirit, which after refining is transferred to the Billingham factory of I.C.I.

Gas separation is carried out in a number of stages at pressure and sub-atmospheric temperatures in a conventionally designed plant which also includes systems for drying and purification of the finished products.

Refrigeration is by means of ammonia and three stages of ethylene and methane refrigeration in cascade.

The engines and compressors of the mixed gases were supplied by Crossley Brothers of Great Britain, and those for ethylene were supplied by Clark Brothers.

The products from the gas separation plant consist of ethylene of 99 percent plus purity and propylene of 95 percent purity. The residue consists of $C_4$ hydrocarbons.

The cracking plant also produces a complex mixture of $C_4$ hydrocarbons containing quantities of "butadiene" at a concentration sufficiently high to permit of economic extraction, for which purpose schemes are at present being developed.

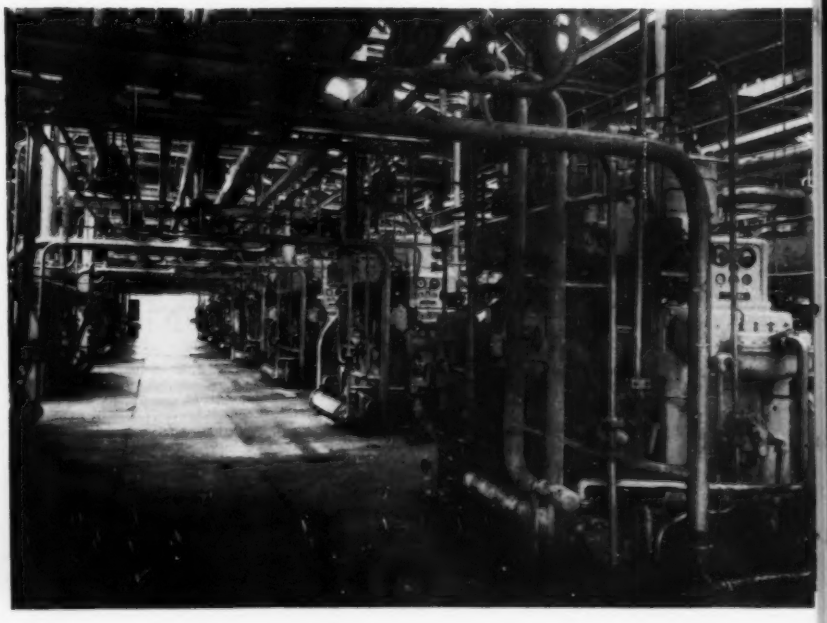
The pyrolysis or cracking plant was designed and engineered by the M. W. Kellogg Co. of New York. It was designed to give as much flexibility of operation as possible, with a feed-stock rate varying between 160,000 and 250,000 tons per annum giving, according to conditions, one third to two thirds this amount of motor spirit and an output of over 30,000 tons per annum each of ethylene and propylene. Erection was carried out by or under control of the Wilton Works Construction Organization, and the whole plant is laid out in such a manner as to accommodate a further plant when required.

# British petrochemical plant processes naphthas

AN IMPORTANT petrochemical plant now operating in the United Kingdom is the olefin plant of Imperial Chemical Industries at Wilton, England. This plant is essentially a vapor phase, atmospheric pressure, high temperature cracking plant designed for a maximum production of $C_2$ and $C_3$ unsaturated hydrocarbons destined to serve as raw materials for the manufacture of chemicals from petroleum.

The plant has a throughput capacity of 250,000 tons per year of naphtha. Distillation limits of the charge stock are not disclosed, but probably come within the heavy naphtha or white spirit limits.

The pyrolysis or cracking section consists of two under-fired pipe stills, with radiant and convection banks for heating the naphtha to about 700°C, and two end-fired steam heater or flash boilers for the generaton of steam at a higher temperature than that of the naphtha. The naphtha temperature is controlled for minimum carbon formation.



*Group of Clark Brothers compressors employed for refrigeration in the ethylene plant.*

# 25 SERVICES

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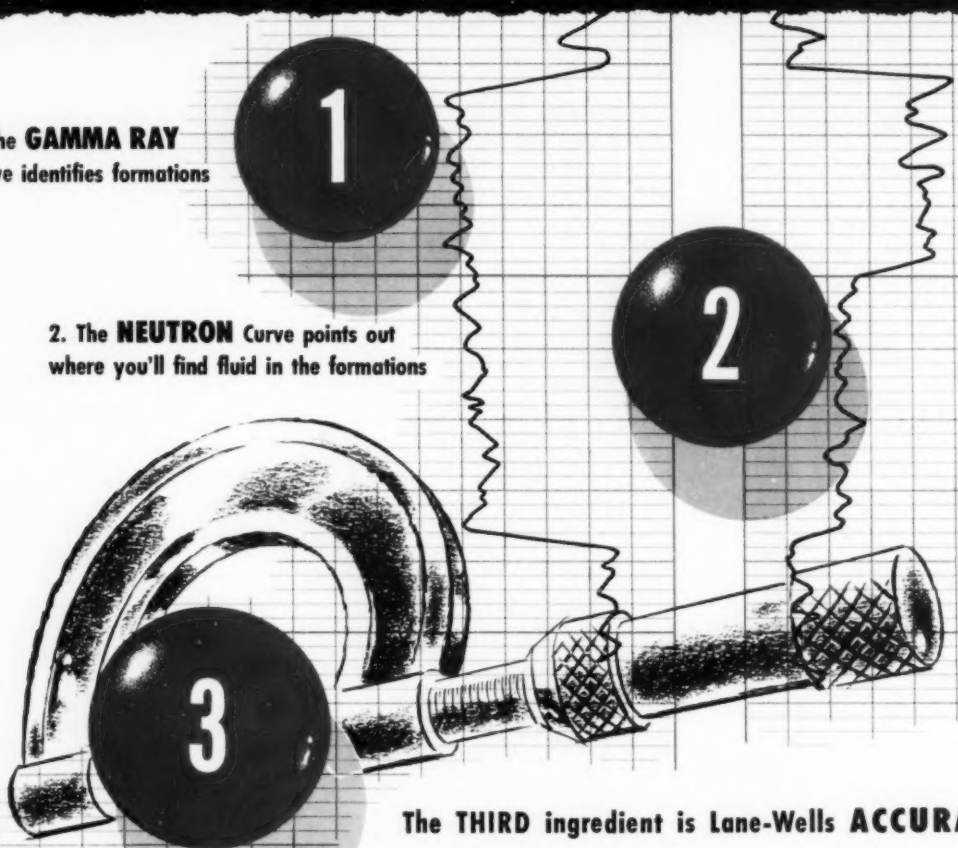


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## Lane-Wells to Expand

Lane-Wells Co. has purchased five acres of land immediately adjoining its present head office, plant and shops property at 5610 South Soto St., Los Angeles, according to Rodney S. Durkee, president. This will more than double the size of the company's Los Angeles headquarters. The land will be used for expansion of shop and office facilities needed to meet the demands of its steadily growing oilfields service business. Lane-Wells and subsidiaries also have extensive plant and service buildings at many of the 75 branches in the United States, Venezuela and Canada.

## Halliburton Appointment

Don Hathorn has been appointed manager of Halliburton Oil Well Cementing Company's mechanical research and development department. The mechanical research and development department conducts basic and applied mechanical research on Halliburton services, tools and equipment. The staff at Halliburton's Duncan, Oklahoma headquarters includes 24 engineers and 35 others. Mr. Hathorn has been a patent engineer with Halliburton for 15 years.

## Baroid Transfers Palmer To Denver

Floyd E. Palmer, assistant general sales manager of Baroid Sales Division, National Lead Co., has been transferred from the Houston headquarters to Denver, Colo., for closer contact with the Rocky Mountain territory.

## Ethyl Promotions

Matthew A. Taylor has been appointed manager of sales operations of Ethyl Corp. He formerly was assistant manager of the eastern region. Donald S. Flynn and George P. Rosser, account representatives, have been named assistant managers, eastern region, with Mr. Flynn located in New York and Mr. Rosser in Pittsburgh.

Other promotions announced are those of William K. McCulloch to assistant manager of the advertising and sales promotion department, and Donald J. Chapman to sales promotion manager. Under the re-organization of the advertising and sales promotion department, of which Russell B. Weston is manager, Frank A. Howard, Jr., will be in charge of advertising and Edwin J. Enoch, Jr., advertising and sales promotion production.

Another change is the creation of district managerships in four sales regions. Appointments in the eastern region are: Roy Goltz, New York City; Robert W. Richardson, Philadelphia; central region, Harry A. Mach, Dayton; George W. Rose, Chicago; Robert R. Mead, Kansas City, Mo.; southern region, Leonard L. Huxtable, Tulsa; Russell Schell, Dallas; J. O. Blazer, Houston; Alan C. Tully, Baton Rouge; western region, Monroe F. Weill, Los Angeles; William H. Sievert, San Francisco; and John S. Cole, Salt Lake City.

## Joins Pacific Valves

Frank Schlemmer has joined Pacific Valves, Inc., as eastern coast divisional sales manager. His headquarters are at 122 East 42nd Street, New York City. Mr. Schlemmer was purchasing agent for the Texas Co., Los Angeles, for a number of years and for the past four years has been purchasing agent for The Texas Co. in New York City.

## Ohio Oil To Install Houdriforming Unit

Contracts for the installation of a Houdriforming unit at The Ohio Oil Company's Robinson, Ill., refinery have been awarded to Houdry Process Corp. of Philadelphia. This catalytic reforming unit, having a nominal charging capacity of 8,000 barrels per day, is designed primarily for the production of high-octane gasoline. Construction will be done by Catalytic Construction Co. under the direction of Houdry. Completion of the work is scheduled for late 1953.

## Joins Johnston Testers

Johnston Testers, Inc., of Houston announces the appointment of W. H. Griffin as manager of the perforating division. This division is introducing jet perforating service in combination with the Johnston formation tester. Mr. Griffin was formerly division manager in the Gulf Coast territory for Welex Jet Services, Inc., and was recently promoted to assistant to the general sales manager. He has had long experience in drilling and producing activities in Canada and South America.

## Cutler-Hammer Promotes Foote

Announcement is made by P. S. Jones, vice president in charge of sales, Cutler-Hammer, Inc., of the appointment of P. C. Foote as assistant manager, foreign sales.

Mr. Foote joined the Cutler-Hammer engineering department in 1941 upon graduation from Cornell University. After serving in the Navy from 1943 to 1946, he rejoined the company's engineering department. In 1948 he was transferred to the Milwaukee district sales office where he remained until his new appointment.

## Hudson Opens New York Office

Edward Reichhelm has been appointed manager of the recently established eastern sales and export office of Hudson Engineering Corp. at 501 Fifth Avenue, New York City. For the past 20 years Mr. Reichhelm has engaged in engineering and sales of process equipment to the petroleum and chemical industries in the New York area. He previously was with the New York sales office of the Alco products division of American Locomotive Company.

*F. Schlemmer*

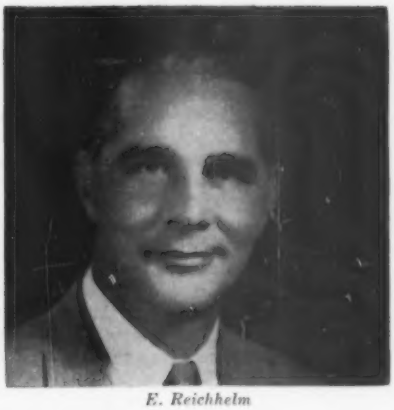
*W. H. Griffin*

*P. C. Foote*

*M. A. Taylor*

*D. S. Flynn*

*G. P. Rosser*



*E. Reichhelm*

# Canadian oil industry expands

By J. L. Irwin

THE Canadian oil industry continued to advance during the first half of 1952. More new fields were discovered. Facilities for transportation and refining were expanded. Only in the case of natural gas has the industry been at a standstill.

Until October 11 not much happened in the way of definite news on gas exports to the United States since the Alberta government early in the year decided that the only surplus gas available for export in the province existed in the Peace River area, and that export from that area to the Pacific Coast would be permitted in certain quantities and under certain conditions.

On October 11 the Board of Transport Commissioners in Ottawa authorized Westcoast Transmission Co. to build a gas line from Alberta to Vancouver. The line must be completed by October 31, 1955. Westcoast officials announced that construction will begin by the middle of 1954 if approval is obtained also from United States authorities. It is estimated that reserves in the Peace River district now are adequate to take care of the Pacific Northwest market for 25 years.

When the Alberta government first proposed that gas exports be made from the Peace River district, the Seattle Gas Co. objected to the "certain quantity," the conditions, the northern route across British Columbia, and the increased price this route was said to entail. The southern route, with Pincher Creek as the main source of supply, would eliminate rock and snow slides and create sizable markets along this route, according to the company's view. It was estimated that the northern route would cost "upwards of 40 cents" per mcf compared with about 32¼ cents via the southern route, which was another definite objection. Still another objection was that the Canadian company via the northern route had no interest in servicing gas to the East. In fact, Seattle Gas objected to the northern route project in its entirety, and refused to have anything to do with it.

If this was Alberta's proposal, they did not want Alberta gas. Other cities in the United States' Northwest Coast area joined in turning to the Pacific Northwest Pipeline Corp., and started negotiations for gas supplies from the Four Corners area of New Mexico, Colorado, Arizona and Utah. The application from this company is now before the Federal Power Commission at Washington.

It has been said many times that without the markets of the U. S. Northwest Pacific Coast, Alberta gas cannot go to B. C. According to the Seattle Gas Co. estimate, 86 percent of Peace River area gas would go to the U. S. and 14 percent to British Columbia if the project were approved. According to an estimate, made recently before the Federal Power Commission hearing, gas to Vancouver alone might cost around $1.00 per mcf, which would be uneconomic enough to eliminate any consideration of constructing a line to the Canadian Pacific Coast.

That seems to be the position at the moment. It has been the position for some months now, during which time there has apparently been no official response to Seattle's objections to the project. If the Federal Power Commission in Washington permits the Pacific Northwest Pipeline Corp. to go ahead, it would seem that Canadian gas would be unable to reach the Pacific Coast, and any proposal for getting it there would have to be forgotten.

In the meantime, one million dollars monthly is being spent in the Fort St. John or northeastern area of British Columbia in drilling surveys, exploration and road building by American and Canadian oil firms. Principals of Pacific Petroleums say that $6 million has been spent on the field to date and another $19 million is to be spent on a 150-well program that will make it the biggest wildcat project ever attempted in a single Canadian oil or gas field.

Pacific Pete's eleventh gasser blew on Oct. 1. Sixteen wells have been started in the area and seismic crews are ranging the virgin country 100 miles up along the Alaska Highway. Roads are being built to criss-cross the 2,000,000 acres held under government lease. Of the 16 wells that have been drilled at an average cost of $100,000, only one, No. 2, has failed to hit gas.

Borders of the Fort St. John field are being extended every week as new gas indications are found. When Fort St. John No. 12 blew in it added five miles to the field, being five miles east of No. 9 which had earlier been regarded as the southeastern limit.

A newly-formed independent has joined the oil and gas hunt in British Columbia with more than 2½ million acres of crown permit lands in northeastern British Columbia. British Columbia Oil Lands Ltd. has acquired its holdings through eight independents with acreage in the Fort Nelson area in the extreme northeast section of the province. Area is 2,535,223 acres.

In his annual report to stockholders, N. Henry Gellert, president of Seattle Gas Co., offered the opinion that Peace River gas reserves are inadequate to support a line. He stressed the technical difficulties involved in laying a line to Peace River, stating that 100 inches of snowfall is usual in the Coquihalla pass and recently the fall was 200 inches followed by snowslides. Part of the proposed line would be submerged by water and part at least 30 miles from a road.

No such controversy has arisen in the case of crude production. The Trans Mountain line is being built on schedule and producers are building reserves to supply the greater outlet which will be made available next year.

Alberta finished the half year of 1952 with an oil production of 24,863,830 mil-

*First carloads of Alberta crude arrive at the Imperial Oil Company's Ioco refinery near Vancouver, British Columbia. Shortage of California crude has forced the company to import 32 tank carloads daily from Alberta, half the current requirements.*

lion barrels to compare with 18,903,723 for the same period of last year. This is an approximate increase of around 6,000,000 barrels. Should this rate of increase be sustained until the end of the year, the annual total would be in the neighborhod of 60,000,000 barrels. The total for 1951 was around 46,000,000.

Footage drilled for the first half of 1952 totalled 1,946,076 to compare with 1,790,537 for the first half year of 1951. Total producing wells for the present half year show an increase of some 800 wells over last year's period. The figures for 1952 are: actually operated, 2,852; capable of being operated, 3,157; for 1951, actually operated, 2,122; capable of being operated, 2,349. At the Interstate Oil Compact Commission meeting at Banff in September, it was reported that Alberta's wells are capable of producing around 280,000 barrels daily, with the largest field, Redwater, capable of producing half this, or 135,000 barrels daily at maximum efficiency rates from 915 wells.

**PRODUCTION OF MAJOR FIELDS IN BARRELS**

| | Half-Year 1952 | Half Year 1951 |
|---|---|---|
| Acheson | 744,518 | 188,729 |
| Armena | 193,579 | ——— |
| Big Valley | 231,233 | 47,620 |
| Bonnie Glen | 81,495 | ——— |
| Campbell | 26,850 | 39,032 |
| Camrose | 71,480 | ——— |
| Conrad | 68,193 | 70,380 |
| Del Bonita | 20,202 | 12,540 |
| Drumheller | 63,082 | 3,303 |
| Duhamel | 127,104 | 51,703 |
| Ellerslie | 18,200 | ——— |
| Excelsior | 392,855 | 283,342 |
| Fenn | 94,957 | ——— |
| Glen Park | 129,417 | ——— |
| Golden Spike | 460,558 | 203,479 |
| Joseph Lake | 509,982 | 270,884 |
| Jumping Pond | 34,888 | 12,194 |
| Leduc-Woodbend | 8,210,512 | 5,683,290 |
| Lloydminster | 510,406 | 391,245 |
| Malmo | 34,078 | ——— |
| New Norway | 126,446 | ——— |
| Princess | 34,542 | 39,321 |
| Redwater | 10,179,933 | 9,566,581 |
| Stettler | 250,975 | 282,645 |
| Taber | 43,691 | 109,041 |
| Turner Valley | 1,380,148 | 1,533,758 |
| Vermilion | 19,688 | 17,974 |
| Wizard Lake | 563,809 | 2,208 |

The hottest oil spot in Alberta, or anywhere in Canada, at the present time is the general Pigeon Lake area. Some remarkable discoveries have been made, the last four of which, Gulf-Fiveland, Texaco-Pigeon Lake, Stanolind and Canadian-Delhi, are deserving of special mention. Not only are they definitely in the major class of producers, but are spread over a considerable area.

While Redwater had the highest production total for the present half year of 10,179,933 barrels, Leduc came a reasonably close second with 8,210,512. Within the last year or two Leduc has been catching up to Redwater despite the fact that allowable production from wells there is less than at Redwater. In 1951, at the end of the half year, Redwater was approximately 4,000,000 barrels in advance of Leduc. This year that advance has been cut to about 2,000,000.

The reason for this, of course, lies in the continual expansion of the Leduc-Woodbend field which has exceeded the expansion of Redwater's area. Leduc's extension is largely responsible.

The accompanying table gives first-half production by fields. There are many fields in the 1952 section that had not made their appearance last year. The newcomers are Armena, Bonnie Glen, Camrose, Ellerslie, Fenn, Glen Park, Malmo, New Norway, and Wizard Lake. Wizard Lake's introduction to the Alberta picture was late last year which includes it therefore more or less in this category.

Early in August, the Gulf-C.P.R.-Fiveland No. 4 well attracted the interest of the entire Alberta oil industry with its promise of unusual performance. It is some nine miles to the southwest of the Bonnie Glen field. The drill penetrated 493 feet of wet gas, with oil body underneath in the D3 zone. The water line is set about 7,345 feet with oil pay in the D3 around 240 feet in depth and above that again in the D3 a depth of 253 feet of rich wet gas. Gravity of oil is 40.5° and rate of production in test around 60 bph.

Canadian-Delhi-Seaboard-Sunray et al-Minnihik No. 1, about 28 miles to the west of the Fiveland producer, was completed at the beginning of August as a potential wet gasser, initial potential tests giving it a capacity of 14 million cubic feet per day in the Madison lime. Production of distillate oil from the wet gas was given at four barrels per million cubic feet. Production tests were taken through perforations in the interval 6,732 to 6,740 feet.

Three miles south of the Bonnie Glen field, Texaco-Pigeon Lake No. A-1 was placed on production in the first week of September. The interval of 7,151 to 7,181 feet was opened by eight shots per foot. On restricted flow test, using a 24/64ths inch choke, the well flowed at 37 barrels an hour, or 888 barrels daily. More than 555 feet of D3 pay was opened up, which included 254 feet of wet gas cap with over 300 feet of oil column above the water line underneath. Indications show this well to be an extension of the Bonnie Glen field three miles to the north.

Stanolind-Cal-Standard-Pigeon Lake No. 1, roughly half way between the Fiveland and Texaco-Pigeon Lake wells, discovered a Devonian D3 coral reef completely separate from the Texaco-Pigeon Lake well to the north and the Fiveland reef discovery three miles to the southwest. The pay zone of this well is considerably thinner than the 500 to 700 foot maximum pay thicknesses at Fiveland and Bonnie Glen. It may or may not contain a thin oil column between its highly productive gas cap and the water line.

Development of this considerably extended general area, with the record of the Wizard Lake and Bonnie Glen oil fields, plus the four major oil and wet gas discoveries over widely spread mileage as a background, will command in the immediate future the closest attention of Alberta's oil industry.

# INTERNATIONAL NEWS AND NOTES

## Trans Mountain Line Progress

Five spreads are now working on the 711-mile Trans Mountain crude line being laid from Alberta to the Pacific Coast.

The fifth spread started work in late September on the 18-mile stretch separating Acheson and Edmonton. Contract for this portion was awarded to Canadian Pipeline Construction Ltd. of Calgary, while Canadian Engineering Surveys Ltd. of Edmonton was engaged for the surveys. More than 250 miles has been laid.

Work has started on the Sumas River crossing working east towards Hope. Two machines dredged the river and about 2½ miles of pipe were strung between the river and Yarrow. Pipe-cleaning and primer machinery has been used on the section north of the Trans Canada Highway. Program calls for completion of the 43 miles between Sumas and Hope before weather slows up the work.

Canadian Bechtel, agents for the owners, expect that 330 to 400 miles of the most difficult portion of the route will be finished before weather halts operations.

With the completion of the Trans Mountain line, export of Alberta crude as far south as California from the Vancouver terminus is predicted by Alberta oil men. California is now importing oil from as far away as Indonesia, and Imperial Oil in Vancouver is now bringing a trainload of oil daily from Alberta because of the shortage of California crude. Imperial will continue to import 32 tank cars daily until the completion of the oil pipeline in August 1953. Canadian Pacific Railway built a new railway spur into Imperial's Ioco refinery to handle the daily shipments.

Trans Mountain plans to export at least 37,000 barrels daily to the United States when its line is operating. Robert L. Bridges says the first oil should reach Vancouver in October, 1953. Of the initial daily volume of 75,000 barrels, half will be used by refineries on Burrard Inlet which are being expanded to be ready for the coming of the line, and half will be exported by tanker to California and the Pacific Northwest.

Initial charge for transporting the oil through the line will be 45 cents per barrel. Loading charge at the Vancouver marine terminus will be 2½ cents per barrel.

Canadian Bechtel, contractors for the $13,500,000 addition to the Imperial Ioco refinery, has started work on the new plant. Preliminary clearing has been done and office quarters erected at the site. John Shea, whose father built the original Ioco docks in 1914, is in charge of construction for Bechtel. Working with him as office manager of the project is Basil Licklider of Los Angeles. Six new trucks and other equipment have been bought for the opening phases of the construction job.

Harvey Vann, of the Fluor Corp., has completed surveys on the $10 million addition to the Shell refinery at Shellburn on the south shore of Burrard Inlet.

## Fuel Line Operating

Pumping of fuel oil through the 18-inch pipe line of the Santos-Sao Paulo duct began Sept. 7. The 10-inch pipe has been in service for light products since Oct. 1951, for diesel oil since last January and kerosine since July. By the end of August 797,125 tons had been carried, namely 673,220 tons of gasoline, 115,848 of diesel oil, and 8,057 of kerosine.

## Brazilian Wildcat

Drilling started early in September on a wildcat in the sedimentary basin of the Parana River in Brazil. The well is situated near Cerro, nine miles north of Angatuba and 110 miles east of the city of Sao Paulo. The rig used is capable of depths up to 8,000 feet.

## Natural Gas Exhibition in Italy

An exhibition of tools, machinery, instruments and appliances connected with the natural gas industry was held in Piacenza, Italy, from September 12 to 21. Italian and foreign firms presented their newest items for surveying, drilling, transportation, and utilization of natural gas.

Italy is now by far the largest gas producing country in Western Europe, and the region around Piacenza is the most important gas and oil producer in Italy. Natural gas available at the wells averages 12 million cubic meters daily, of which only five million is distributed through a pipeline system which approaches 1,000 miles in total length.

A technical convention on natural gas utilization took place in Piacenza Sept. 13-15 with about 250 technologists in attendance. Most important subjects discussed were the construction of new pipe lines, prospecting outside the Po River basin, where practically all Italian oil and gas resources exploited are located, safety specifications and regulations, distribution of natural gas for domestic heating and for industrial purposes, and questions concerning prices and local taxation.

## To Drill in Sicily

R. S. Macmillan, president, and S. M. Batterson, executive vice president of the Macmillan Petroleum Corp., have been named directors of the Mediterranean Oil Co., a Gulf and Macmillan owned subsidiary formed to drill for oil in Sicily. The American International Fuel and Petroleum Co., a subsidiary of Gulf, has scheduled the starting of a deep test well on its Ragusa concession in Southeastern Sicily for early in 1953. The drilling of a second exploratory well is also scheduled for next year on a concession originally granted to Macmillan. This concession has since been transferred to the Mediterranean company.

Both Gulf and Macmillan have been carrying on exploration activities in Sicily for several years. The findings have convinced geological and technical experts that oil and gas in commercial quantities may exist in Sicily. Plans are to drill to 12,000 feet if necessary.

Other directors of the Mediterranean Oil Co. are J. F. Drake, S. A. Swensrud, Dr. K. C. Heald, R. O. Rhoades, and P. O. Settle, all of Pittsburgh, Pa. Mr. Drake is chairman and Mr. Swensrud is president of this joint Gulf-Macmillan owned company.

## Persian Gulf Concession

A second off-shore exploratory concession has been taken by Royal Dutch/Shell interests in the Persian Gulf. The new concession is off the shaikdom of Abu Dhabi. Previous concession was beyond the 3-mile limit offshore from Qatar, a concession recently abandoned by Superior Oil Co.

## Somaliland Geological Study Begun

Sinclair Somal Corp., a subsidiary of Sinclair Oil Corp., announces that Amerada Petroleum Corp., Continental Oil Co., and the Ohio Oil Co. have each acquired a one-sixth interest in the petroleum concession held by Sinclair Somal Corp. in Italian Somaliland. Geological operations on the concession have already begun.

L. V. Stanford, president of Sinclair Somal Corp., stated that the company has opened an office in Mogadiscio under the direction of T. J. Donovan, assistant to the president.

## High Speed Pipe-Laying

Four 10-inch pipelines, two 8-inch lines and two 4-inch lines were laid simultaneously in one hour across the quarter mile wide Süder Elbe River at Hamburg, Germany, to link the Shell refinery at Harburg on the south side of the river to the new storage tank site on the north side.

Owing to the density of river traffic and complications in the rise and fall of the tide, it was not possible to lay these lines by the conventional method of floating them into position on pontoons and then lowering them to the bed.

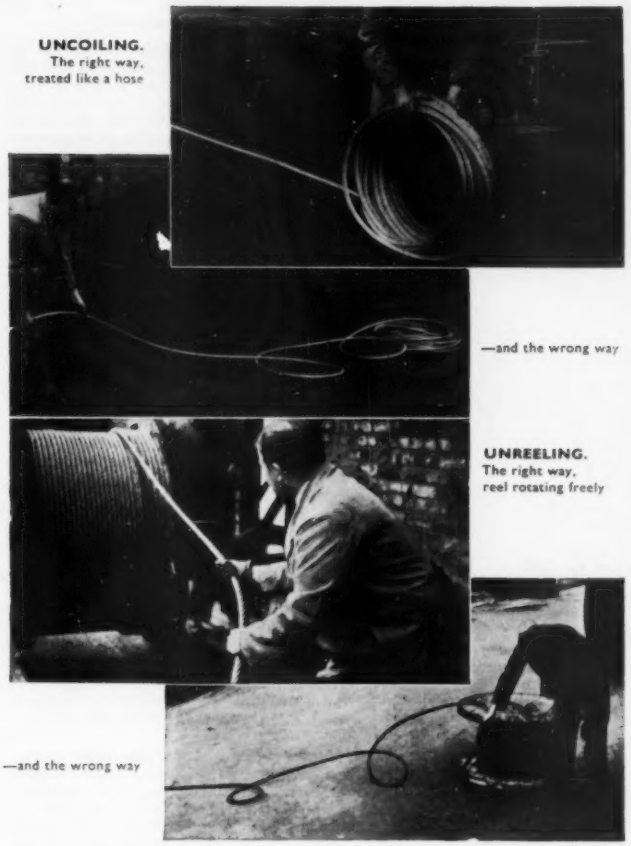
The pipes, protected against corrosion by thick coatings of bitumen and glass fibre wrapping, were laid on a launching way consisting of greased railway lines at right angles to the river, the approaches on both the launching and landing side being cut back to ensure an easy contour to the river bed. At the leading end a launching nose was fixed to prevent the pipes being caught up in the bed of the river during the operation.

The launching nose and assemblage of pipelines was then connected by a 2-inch steel cable laid across the river and attached to three powerful locomotives on the other side, and slowly drawn from the new site on the north to the refinery side, being laid in a 6-foot channel already dredged in the bed of the water way.

*Artist's impression of the pipeline laying operation showing the Harburg refinery in background.*

IF ROPE COULD TALK . . .

# "I'm mighty like a hose!"



**UNCOILING.** The right way, treated like a hose

—and the wrong way

**UNREELING.** The right way, reel rotating freely

—and the wrong way

Good rope repays care in handling. Never allow kinks to form when UNCOILING or UNREELING a steel wire rope. Treat it like a hose pipe. A light coil of rope may be unrolled along the ground but should always be kept under control. A reel may be placed on a turntable or mounted on stands and supported by a bar or tube through the hole in its centre. In no case should a coil or reel be laid on the ground and the end taken over; kinks will inevitably form and the rope's life and efficiency be seriously reduced. When COILING down a rope always put in under-turns as required to counteract the tendency of the rope to twist itself. Under-turning is simple — the rope itself will indicate that.

*Write for a copy of a new booklet "If Rope could Talk".*

**British Ropes Limited**

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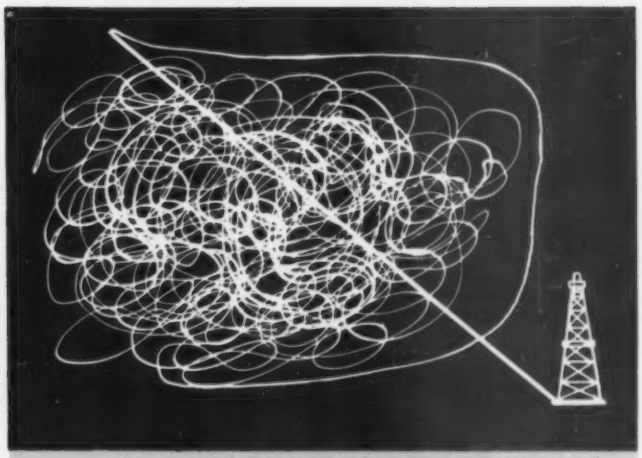

Indecision dissolves before straight-line thinking based upon positive, accurate, organized information.

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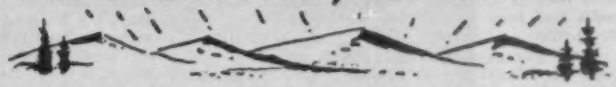

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# PETROLEUM INFORMATION

**PUBLICATION HEADQUARTERS** Continental Oil Bldg. Denver, Colorado Phone: ALpine 4656 TWX: DN 327

**REPRODUCTION HEADQUARTERS** 315 No. Wolcott St., Casper, Wyoming Phone: 4782 TWX: CP 49

**SERVICE REPRESENTATIVE** 111 No. 30th St., Billings, Montana Phone: 9-6661

## Lobitos 1951 Operations

In 1951, Lobitos Oilfields Ltd. increased its Peruvian production by over 13 percent, racking up a record of nearly 9,000 b/d as compared with about 8,000 b/d in the previous year. The bulk of the increase came from the Lobitos field—2,438,518 barrels in 1951 as against 1,338,592 in 1950.

The increase came mainly from two pools in Lobitos, and would have been greater except that a number of wells were closed in pending the arrival of equipment for repressuring. International Petroleum Co. has had excellent results from repressuring operations in an adjoining area, and Lobitos Oilfields is currently studying the possible effect on ultimate recovery of applying similar methods to other areas in Lobitos and El Alto fields.

An agreement entered into by Lobitos and IPC in 1950, for the joint development of a small area on the boundary of the Lobitos field, reached the profit-earning stage by the end of 1951. Lobitos' share of this joint production amounted to about 350,000 barrels in 1950. In view of these results, a further joint-development agreement has now been made, covering an area which lies between the El Alto and Lobitos fields. Little or no geological information is available on this post-Tertiary tableland, but geophysical crews have been at work. To the middle of 1952, two wells had been drilled, but without obtaining production.

Total footage drilled by Lobitos during the year was 191,657 feet, as against 163,779 feet in 1950, and 50 wells were completed, the majority of them producers. The increase in footage drilled is attributable mainly to improved drilling techniques and better mud control. A new productive pool was located north of Lobitos. An additional good well has been completed in that area since the end of 1951.

The new petroleum law recently promulgated in Peru is not likely to affect the operations of Lobitos Oilfields. The Lobitos concession dates from 1926 and runs for an indefinite period. Under the new law, however, the same concession could run for only 40 years, with a possible extension of 20 years. Lobitos will naturally prefer to exercise its right to continue under its existing contract.

Under both the old and new laws, producers are obligated to supply refined products to the home market proportionately to their production, at prices fixed by the government. Both Lobitos Oilfields and International Petroleum have made continued requests for authorization to increase the present sales price. A commission set up by the Peruvian government to study the question has recommended that the companies be permitted a reasonable profit on refined products, and there appears to be some hope that an increase in prices will eventually be authorized. It is estimated that 55 percent of the 1952 production of Lobitos Oilfields will go to the Peruvian market.

The tankers operated by Lobitos showed an increased profit over the previous year, but El Mirlo is due for survey this year, El Aleto and El Gallo in 1953.

The refinery at Ellesmere Port, designed to operate on sulfur-free crudes such as those the company produces at Lobitos, has a Dubbs cracking unit. This has now been modernized, at a cost of about $200,000, so as to operate on sour crude. The cracking of Middle East crude in the altered plant was scheduled to start in September.

During the year, Lobitos Oilfields acquired the remaining shares of Cork Harbour Oil Wharves, Ltd. This company, which had ceased refining operations early in the war, was then liquidated. Its wholly owned subsidiary, Shamrock Petrol Ltd., which marketed refined products in Eire, is now directly owned by Lobitos. With Shamrock and two other subsidiaries (British Viscoleum Fuels Ltd., and Holmes, Mullin and Dunn Ltd.), Lobitos Oilfields now has distributing organizations operating throughout Ireland and in the northwest area of the United Kingdom.

Payment of a final dividend of 10 percent and a bonus of 7.5 percent was voted at the annual meeting, making a total of 22.5 percent for the year 1951.

## Brazil Tightens State Monopoly

In order to secure the approval of all parties in the Brazilian Congress for the recent bill establishing a state monopoly of petroleum, the leader of the Chamber of Deputies, although holding a sufficient majority to enact the measure as it stood, agreed to certain changes proposed by minority groups. These include an amendment specifically precluding foreign participation, direct or indirect, in the capital of the state company, Petrobras, and another amendment demanded by the National Democratic Union confirming the monopolistic position of that company. Existing refining concessions are confirmed, agreement to this exemption being accepted by the opposition on the explanation that Petrobras, on account of its preferred position, ultimately would absorb these. The following articles therefore were included in the bill:

*Article A.* Prospecting and exploitation of petroleum and other liquid hydrocarbonates and rare gases in national territory; the refining of national or foreign petroleum; transportation by sea, river and lake of national crude petroleum, or of petroleum products produced in the country, as well as the transport by pipes of crude petroleum and its derivatives and rare gases of any origin, constitute a monopoly of the Union.

*Article B.* The Union will exercise the monopoly established in the preceding article through the National Petroleum Council, as the directing and supervising organ, and through the share society Petroleo Brazileiro S.A. and its subsidiaries, constituted in accordance with the present law.

Privately-owned tankers, now employed in the transport of petroleum and petroleum products, are excluded from the monopoly.

## To Drill In Switzerland

Itag Internationale Tiefbohr AG. is about to sink the first deep oil well in Switzerland since the war. The well will be situated in Nebikon/Kanton Luzern, and will be sunk by order of a Swiss joint interest group, headed by Iborag, Zurich. The necessary equipment has already been installed by Itag.

## To Drill 100 Wells in Panuco

A project calling for drilling 100 wells in the municipality of Panuco, in the State of Veracruz, is expected to get under way shortly. Pemex has already spudded in Champayan No. 1 in the Ebano field, and is planning to put down a number of others in the same region.

## Chairman Resigns

August Schneider, chairman of Verband Schmierfett-Industrie has resigned after leaving the firm of Mineraloelwerke Albrecht & Co. Deputy Chairman Karl Hundertmark of Oelfabrik und Raffinerie Carl Bechem GmbH., Hagen (Westphalia), is acting as chairman.

## New Pemex Discovery

An 800-barrel a day producer, known as Manuel Avila Camacho No. 1, has been brought in at a settlement of the same name close to Poza Rica, in the state of Veracruz, it was announced in Mexico City by officials of Petroleos Mexicanos.

They said studies of the location by Pemex exploration experts presage existence of a new field the extent of which cannot be determined at present. It is planned to sink another hole immediately in the vicinity.

## Increase in Pernis Capacity

The present 6 million tons per year capacity of the Royal Dutch/Shell's Pernis refinery at Rotterdam is to be increased by about 50 percent by the beginning of 1954, when it will have a throughput of 9 million tons per year. This additional capacity will come from a new 70,000 barrel distillation unit on which preliminary construction work has started.

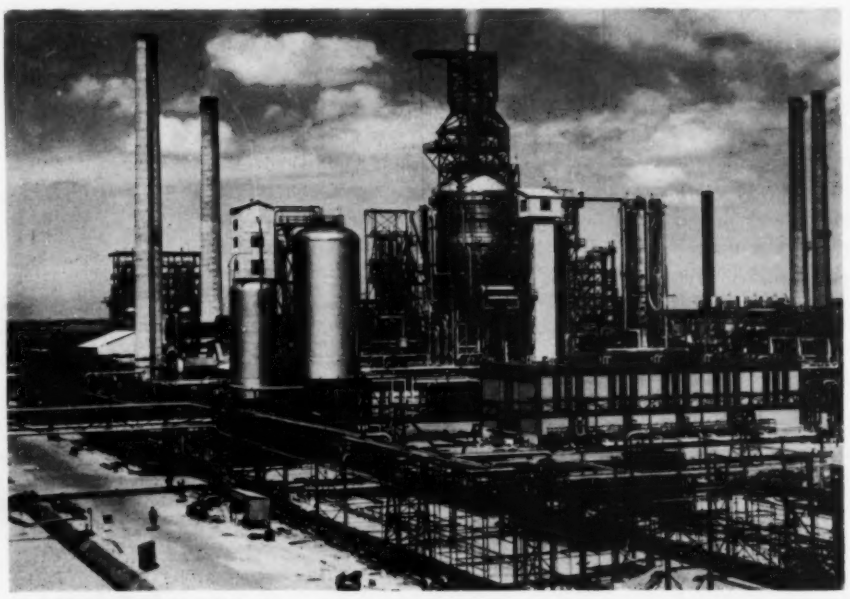
This plant has been designed by the Bataafsche Petroleum Maatschappij (Royal Dutch/Shell Group) at the Hague, with the exception of the pipe still furnaces which have been designed by the Lummus Co.

The main distillation section comprises an 82-foot primary column, a 115-foot middle distillate column and a 138-foot vacuum column.

The gasoline section has a gasoline splitter column, to enable light and heavy gasolines to be treated separately, a stabilizer and a depropanizer column.

There are three pipe still furnaces to the unit, which will be equipped with special burners for asphalt or gas firing. Product feed heat exchangers with a total area of about 6,000 square meters have been installed to give a very efficient heat balance.

All feed and product pumps are motor driven centrifugal to a total of 3,000 hp. The estimated cost of the unit is £2,000,000. The catalytic cracking unit of this plant, with a capacity of 1,250,000 tons a year, was the first modern catalytic plant to be started up in Europe and has now been on stream a year.



*View of the cat cracker at Shell's Rotterdam refinery, the largest in Europe.*

Our Goal
is the Right equipment
in the Right hands
MARINE

## Review Pemex Accomplishments

Senator Antonio J. Bermudez, director-general of Petroleos Mexicanos, warmly defended the government oil industry's policies in a 45-minute speech delivered recently before the Mexico City Rotary Club. During the six years of President Miguel Aleman's regime, he said, 31 oil fields have been discovered—some of them capable of producing 100,000,000 barrels or more. Mexico's production will probably reach 80,000,000 barrels this year. In addition, Bermudez said, Mexico's reserves are now 2,140,000,000 barrels, in comparison to 835,000,000 in the expropriation year of 1938.

Owing to Mexico's industrialization program, he said, domestic gasoline consumption has jumped from 330,000,000 liters annually in 1934 to an expected 2,600,000,000 liters this year. He predicted this trend will continue and spoke of an increase of 1,000,000,000 liters by 1956.

Mexican refineries are processing 187,000 barrels a day and construction of three large refineries on the Pacific Coast is being considered. They would be located at Salina Cruz, in the state of Oaxaca; Mazatlan, in the state of Sinaloa; and Guaymas, in Sonoro state.

Senator Bermudez reported the oil agency's marine fleet has grown 65 percent since 1946. Some 2,000 kilometers of oil and gas lines have been laid.

He also revealed Pemex is considering construction of a new refinery, or at least amplification of existing facilities, close to Mexico City.

## Fuel Tax Upheld

The Brazilian Federal Court of Appeal has ruled that the additional tax of 9 centavos per liter on fuel oil, due to the Pensions and Retirements Fund of Employees in Transport and Cargo Services (IAPETC), is not contrary to the Constitution. President Vargas has, therefore, instructed the Petroleum Council to take steps enabling IAPETC to collect the tax.

## To Drill Wildcat in Australia

For starting "wildcat" drilling operations in Western Australia, National Supply Co. recently produced and assembled a complete 16,000-foot drilling rig and associated equipment. The rig was set up recently at the company's Torrance, Calif., plant for inspection and tests before shipment. It was built for The California Texas Oil Co., for ultimate use by West Australia Petroleum Proprietary, Ltd., a new joint enterprise of AMPOL, an Australian organization, and Caltex.

Explorations are being directed by the West Australia Petroleum Proprietary, Ltd. A preliminary commitment of $3 million has been assumed by Caltex toward completion of the first well. The project is being directed by Carl Newcomb, a veteran in wildcatting, whose experiences extend over Venezuela, Colombia, the Philippines and Indonesia.

The area being prospected is the North West Basin, an arid desert tableland with large stone outcroppings and covered with porcupine grass that cuts like a razor. Only dirt roads are available for transportation. Weather hazards include a hot sun and monsoons which blow in from the Indian Ocean at certain seasons. Although the Ashburton river and tributaries are in this area, surface flow is rarely maintained throughout the year. Only permanent inhabitants are sheep ranchers, whose stations are separated by 150 and 200 miles usually.

Fremantle near Perth is the only port in West Australia prepared to unload heavy equipment from ocean-going freighters. Probable location of first drilling operations is in the vicinity of Exmouth Gulf some 800 miles overland from Fremantle. The area is served by coastwise freighters, but neither these nor the roads are adequate for transport of heavy pieces of drilling equipment. Eventual solution of the transport problem was to charter initial shipment of some 1,200 tons from the East and West coasts of the United States directly to Exmouth Gulf, but with a stop at Fremantle to pick up supplies from the United Kingdom. Three LCM's were sent as deck cargo on the freighter and these were used in beaching the cargo. Trucks and tractors were beached first and went immediately into service, moving the remaining cargo to an inland storage area over previously graded roads.

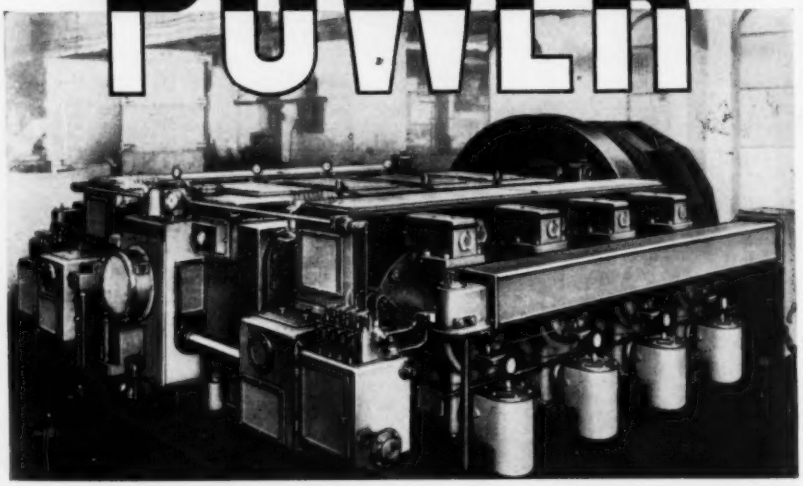
## Proposes New Housing Policy

Creole Petroleum has submitted to the Venezuelan government plans for an integrated city near its refinery at Amuay on the Paraguana Peninsula, and is asking that the nation contribute 35 percent of its estimated $10 million cost, on the grounds that the creation of this urban center goes beyond the company's legal obligation to furnish housing to its workers. The plans are under study by the National Commission of Urbanism, which is expected to give approval very soon to at least the ideological concepts advanced by Creole.

It is Creole's theory that, conditions being equal, workers would rather live in towns or cities than in the artificial confines of an oil camp. Aside from the fact that oil camps generally contribute little in a direct way to the overall welfare of the regions where they are situated, life in a company camp tends to stifle the individual initiative of the worker and to foment a paternalistic, even socialistic philosophy. Creole holds that such conditions are not conducive to the development of interest in what are normally civic concerns, and keep the thinking of dwellers in such conditions indifferent to community welfare.

Instead of building housing for its thousands of workers, as it has always done in the past, Creole proposes this time simply to make the funds (or 65 percent of them) available for the creation of a town, with full public facilities, for 15,000 inhabitants. This would be a radical departure from the industry's general policy in the past.


POWER



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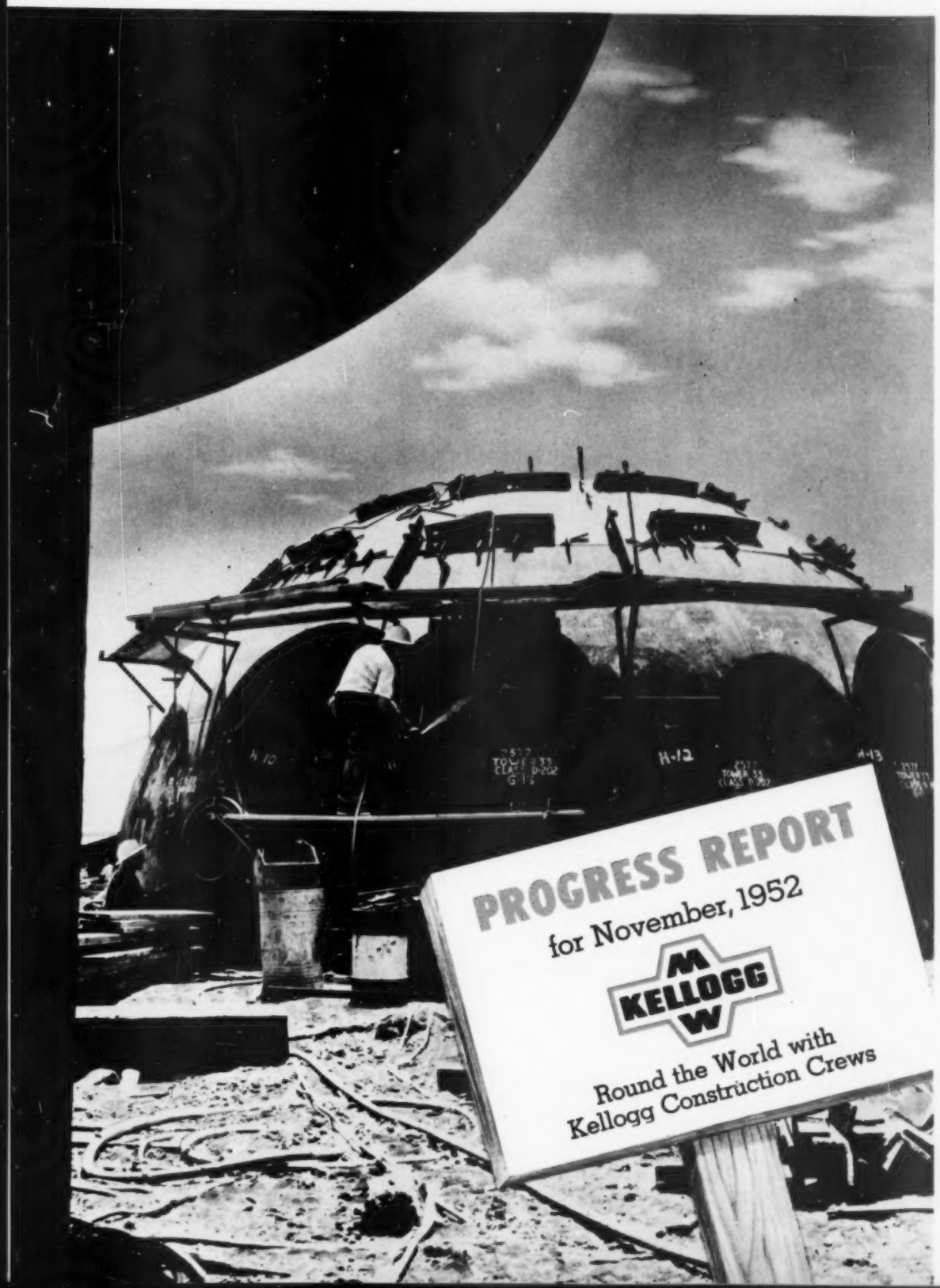

PROGRESS REPORT
for November, 1952
KELLOGG
Round the World with
Kellogg Construction Crews

# PROGRESS REPORT for November

First pictures of gasoline-from-coal synthesis plant in South Africa reveal considerable foundation work and structural steel already in place. The $50 million plant embodying Kellogg's Synthol process is the first commercial unit of its kind.

In the Southwest another important modernization program is beginning to take shape. Among the major units to be installed is an Orthoflow Fluid catalytic cracker. Here a crawler crane is employed in the erection of a pedestal for a guy derrick.

On the Gulf Coast, two three-stage pipe stills are well underway with completion scheduled for 1953. The units each comprise pre-fractionator, topping and vacuum towers. Main fractionator of one 60,000-BPD unit is shown in left foreground.

ROUND THE WORLD WITH KELLOGG CONSTRUCTION CREWS

# 1952...continued...

(PHOTOS SHOW ACTUAL FIELD CONDITIONS AS OF OCTOBER 1, 1952)

Rated at approximately 63,000-BPD reactor throughput, a huge Fluid catalytic cracker is being erected in Philadelphia. This view shows recovery and underground water lines. Inset picture reveals progress on structural steel for main fractionator and catalyst storage drums.

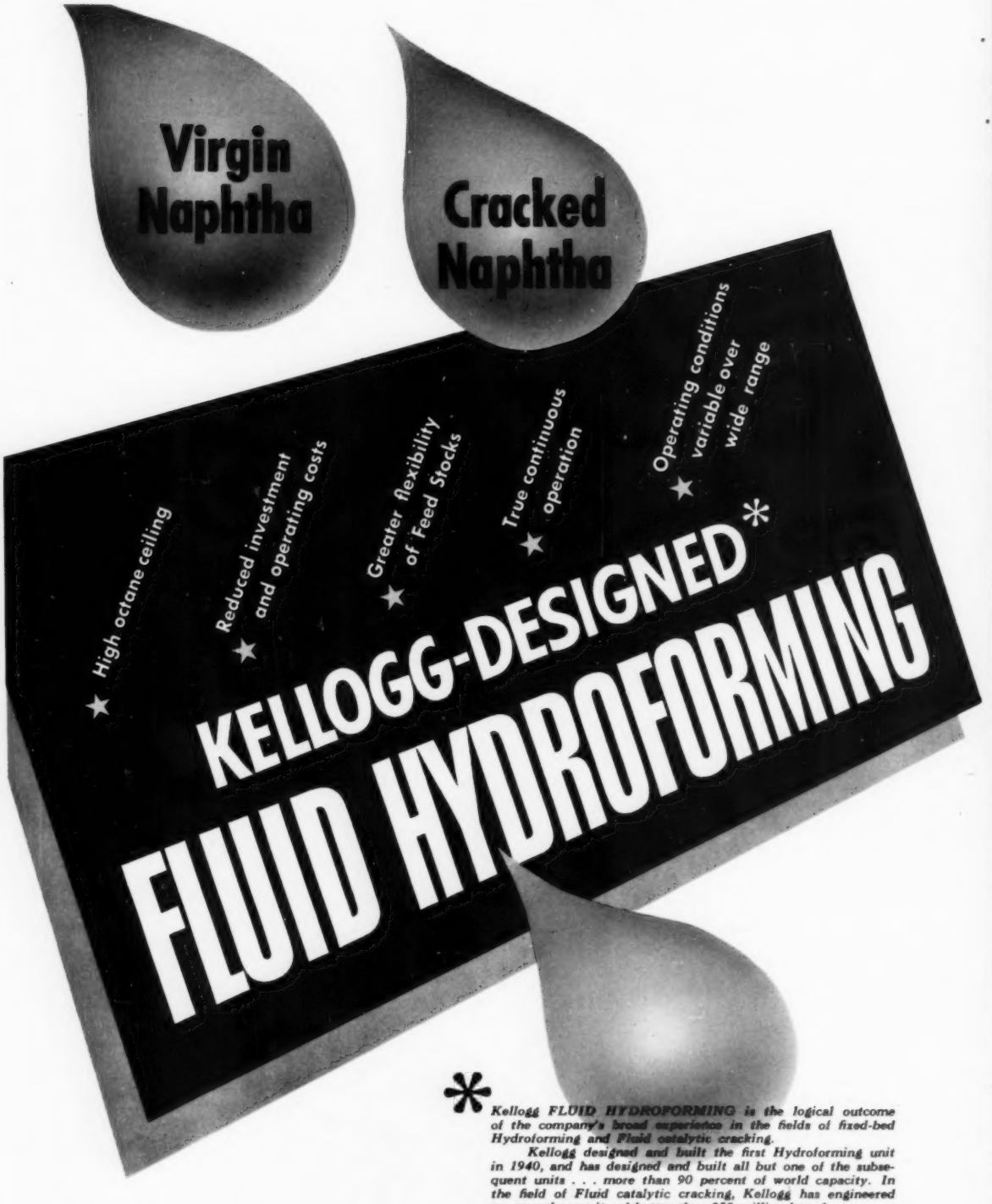
In Argentina, a complete 28,300-BPD refinery is moving steadily along. Furnace stacks to the rear of the vertical furnace belong to the main crude furnaces. In the background, may be seen the outlines of a Fluid catalytic cracker.

One of nearly a score of chemical projects is on the pile driving stage on the West Coast. Pre-cast cement piles are being driven down to bed rock for this ammonia plant. One of its features will be Kellogg-designed reactors.

**PROGRESS REPORT CONTINUED ON THIRD FOLLOWING PAGE . . .**

IMPORTANT!
**See next page for message about FLUID HYDROFORMING**
M. W. KELLOGG

**ROUND THE WORLD WITH KELLOGG CONSTRUCTION CREWS**




*Kellogg **FLUID HYDROFORMING** is the logical outcome of the company's broad experience in the fields of fixed-bed Hydroforming and Fluid catalytic cracking.*

*Kellogg designed and built the first Hydroforming unit in 1940, and has designed and built all but one of the subsequent units . . . more than 90 percent of world capacity. In the field of Fluid catalytic cracking, Kellogg has engineered an annual capacity of better than 350 million barrels.*

*Comprehensive data on Fluid Hydroforming for both naphtha upgrading and aromatics production—from the company's own pilot plants and from all other authoritative sources—is available to Kellogg customers.*

**First to go on stream . . .** will be this Fluid Hydroformer for a Gulf Coast refiner. It is scheduled for completion this month. Two others are now being engineered by Kellogg—one to be located in Louisiana and the other for the Mid West.

Each brings the advantages of efficient fluid catalyst techniques to the upgrading of naphthas . . . each is engineered to provide great flexibility in choice of operating conditions.

Catalyst level in the reactor can be varied over wide limits. The turbulent catalyst bed serves to improve catalyst-feed contact, and also functions as an important aid in temperature control. Steady, uninterrupted production of desired quality may be maintained continuously on any given feed stock, since fresh catalyst is introduced as necessary to maintain desired catalyst activity and selectivity.

*Fluid* Hydroforming provides higher octanes from low quality naphthas. And since it is a continuous, regenerative process, it is adjustable to a variety of feed stocks from hexanes (for benzene production) to kerosene, including virgin heavy naphthas, high-sulphur cracked naphthas and mixed virgin-and-cracked feed.

*Fluid* Hydroforming is not only more economical in operation but also requires a lower initial investment than comparable fixed-bed equipment. If you are considering expansion or renewal of naphtha processing facilities, a study of Fluid Hydroforming advantages will be rewarding.

Actual commercial operating data from this first plant will soon be available. But meanwhile, a Kellogg bulletin, "FLUID HYDROFORMING", gives detailed pilot plant data on performance of the process in handling virgin, coker and mixed naphthas from several different crudes. Copy will be mailed on request.

## THE M. W. KELLOGG COMPANY

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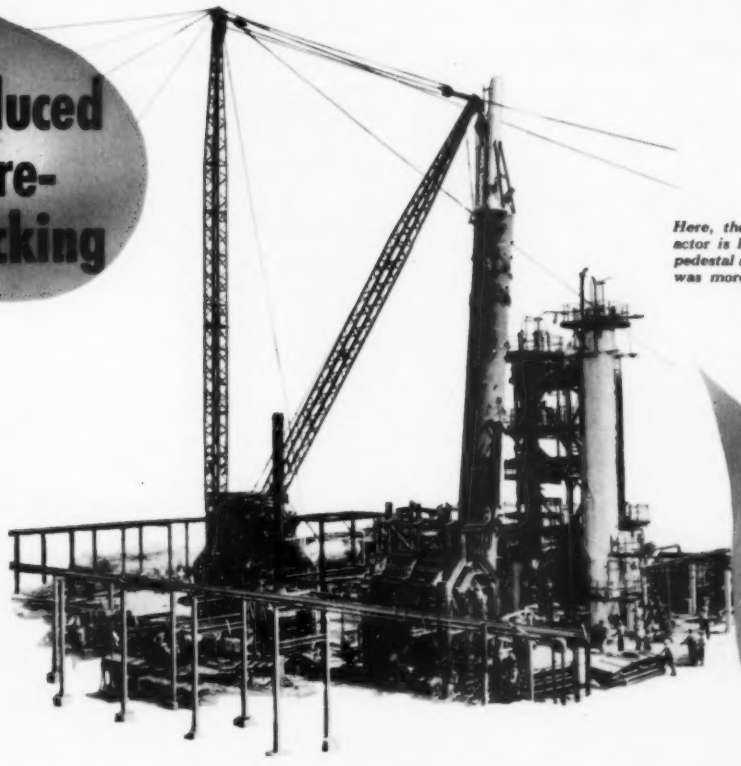
Reduced Pre-Cracking

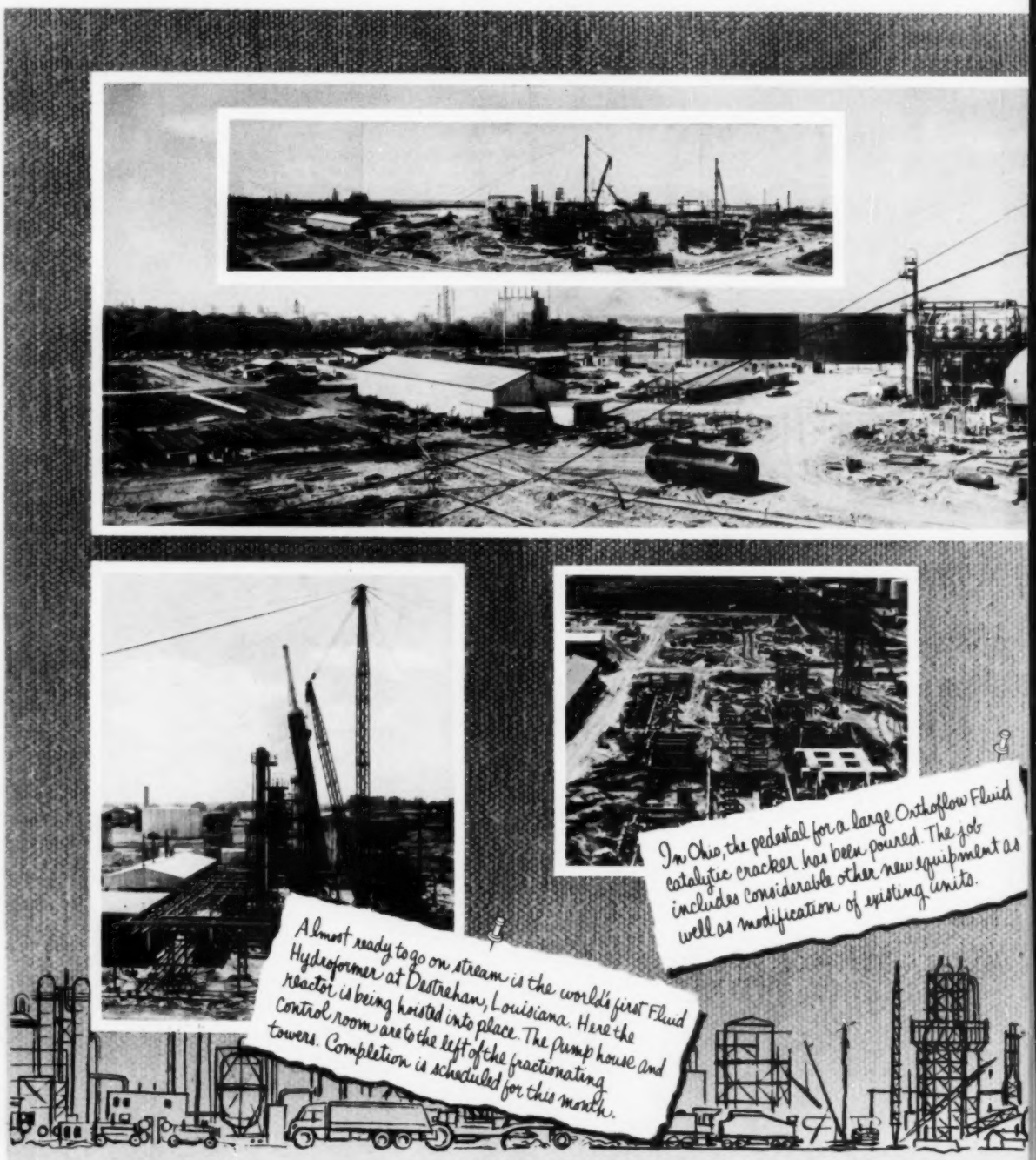


*Here, the Kellogg-designed reactor is lifted onto its concrete pedestal at a time when the unit was more than 80% complete.*

High Octane Ceiling

NEW YORK JERSEY CITY LOS ANGELES TULSA HOUSTON TORONTO LONDON PARIS

# PROGRESS REPORT for November,



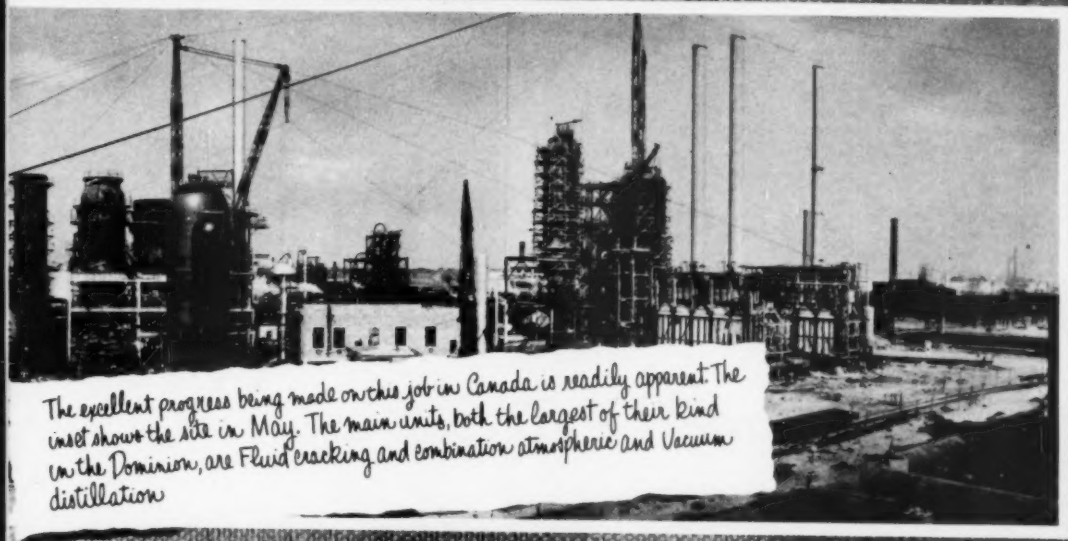
Almost ready to go on stream is the world's first Fluid Hydroformer at Destrehan, Louisiana. Here the reactor is being hoisted into place. The pump house and control room are to the left of the fractionating towers. Completion is scheduled for this month.

In Ohio, the pedestal for a large Orthoflow Fluid catalytic cracker has been poured. The job includes considerable other new equipment as well as modification of existing units.

ROUND THE WORLD WITH KELLOGG CONSTRUCTION CREWS

# 1952...continued...

(PHOTOS SHOW ACTUAL FIELD CONDITIONS AS OF OCTOBER 1, 1952)



The excellent progress being made on this job in Canada is readily apparent. The inset shows the site in May. The main units, both the largest of their kind in the Dominion, are Fluid cracking and combination atmospheric and Vacuum distillation

The British Isles are the scene of major activity in the erection of Kellogg-designed units. One of several different projects, this 17,500 vacuum flasher is now being finished in Scotland. The main furnace is shown to the right while in the foreground is the water cooler.

Shielded against the raw Wales' winds, welders continue work on the regenerator of a 10,000-BPD Fluid cracker for a British refiner. In other parts of the Isles, construction crews are erecting two additional catalytic crackers as well as other refining and chemical plants.

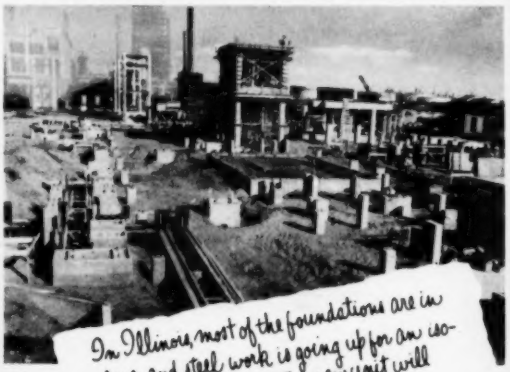
PROGRESS REPORT CONCLUDED ON NEXT PAGE

M. W. KELLOGG

ROUND THE WORLD WITH KELLOGG CONSTRUCTION CREWS

# PROGRESS REPORT for November, 1952

KELLOGG



In Illinois, most of the foundations are in place and steel work is going up for an iso-octyl alcohol plant. The new unit will produce 10 million pounds annually.

This site was barely cleared in May. Now the world's first Phenol-from-Cumene plant is beginning to assume its finished appearance. The slender towers to the right are for purifying end products—phenol, acetone and methyl styrene

In Italy, a thermal reformer (above) was just completed at press time. To improve the overall octane rating of the gasoline pool a catalytic polymerization unit is also under construction. Its partially-bricked control house is on the left. (see below)

## OTHER MAJOR CONSTRUCTION PROJECTS IN WORK

**Alkylation Plant — U.S. East Coast**
**Cat Poly Unit — Scotland**
**Complete Refineries — One for Chile; one for Iraq; two for Brazil**
**Deasphalting Units — two, U.S. Southwest, England**
**Decarbonizing Unit — U.S. Southwest**
**Desalting Unit — U.S. East Coast**
**Fat Splitting Unit — Norway**
**Fluid Hydroforming Units — two, U.S. Gulf Coast, Midwest**
**Olefin and Petrochemicals Plant — Italy**
**Orthoflow Crackers — two, U.S. East Coast, Canada**
**Phenol-from-Cumene Plant — U.S. East Coast**
**Phenol Treating Unit — U.S. Southwest**
**Phthalic Anhydride Plants — two, England, Italy**
**Solexol Decolorizing and Fractionating Unit — Norway**

A KELLOGGRAM HAS JUST BEEN ISSUED WHICH FEATURES KELLOGG CONSTRUCTION OPERATIONS—IF YOU HAVEN'T RECEIVED YOUR COPY JUST DROP A LINE TO 225 BROADWAY, NEW YORK

ROUND THE WORLD WITH KELLOGG CONSTRUCTION CREWS

# OIL COMPANY STAFF CHANGES

*E. A. Desmond*

**EDWIN A. DESMOND** has been named head of a new section in the technical service division of Ethyl Corp. which will be concerned with diesel engines, diesel fuels and diesel fuel additives. In his new assignment, he will assume responsibility for all field tests of diesel fuels and diesel fuel additives, and will coordinate field test work with Ethyl's laboratory research programs.

*W. A. Clark*

**THOMAS E. MONAGHAN,** a member of the law department of Standard Oil Co. (N. J.) and n director of Esso Export Corp., has been appointed an associate general counsel of Jersey Standard. Mr. Monaghan has served on the company's legal staff for the past six years and has been an Esso Export director since July, 1951. Before joining the Jersey Standard organization, he was counsel for Pan American Petroleum and Transport Co. and a director of The American Oil Co. and Mexican Petroleum Corp.

**WILLIAM A. CLARK** has been appointed general manager of the foreign producing department of The Texas Co. Mr. Clark, who joined Texaco in 1929 on the Pacific Coast, has been in the foreign producing department since 1947. He is vice president of South American Gulf Oil Co. and Colombian Petroleum Co., Texaco affiliates, and vice president of Texas Petroleum Co., a wholly owned subsidiary operating in the Western Hemisphere and West Africa.

*J. H. Ellender*

**CLIFTON S. CORBETT,** manager of Socony-Vacuum Exploration Co., Calgary, Alberta, Canada, has been transferred to the New York office as advisor to the coordinator of domestic production. Hiram R. Moorman, chief geophysicist of Socony-Vacuum, will succeed Mr. Corbett. With the recent retirement of Dr. Arthur E. Fath, Edward C. Cram will follow Canadian operations along with other duties as assistant to the coordinator of domestic production.

**JOSEPH H. ELLENDER** has been appointed chief economist of the Arabian American Oil Co. Prior to joining Aramco, Mr. Ellender was assistant manager of the economics department of The Texas Co., a position he accepted after wartime service with the P.A.D.

Mr. Ellender has been active in industry-wide problems. He served as a member of the American Petroleum Institute statistical advisory committee and of the economic advisory committee to che Interstate Oil Compact Commission and the Subcommittee on Demands of the Military Petroleum Advisory Board.

*Dr. Charles Russell*

**DR. CHARLES D. RUSSELL** has been named to head a new department, dealing principally with development of new methods to improve oil recovery, which has been organized at the research laboratory of The Carter Oil Company, Tulsa. Dr. Russell has been engaged in exploitation research since joining Carter in 1946.

**E. S. NEAL** has been appointed general manager of the producing department of Imperial Oil Ltd. to succeed W. O. Twaits who recently became a vice president of the company. Mr. Neal comes to Imperial from producing coordination, Standard Oil (N. J.). He joined the Jersey group in 1926 and went to Venezuela with the Lago Petroleum Corp. as a geologist. He remained there until 1938, rising to the position of chief geologist. At that time he transferred to Standard Oil (N. J.) in New York where he first was in charge of worldwide reserve studies and later head of the producing economics section.

**WILLIAM A. WILLIAMS,** superintendent of Imperial Oil Company's Montreal East refinery for the past two years, has been appointed managing director of the Standard-Vacuum Oil Company's new refinery at Bombay, India. During his 18 years with Imperial, he held several positions at Sarnia refinery, including senior process engineer and manager of the technical service department. Before going to Montreal in 1950, he was assistant superintendent in charge of process operations. Mr. Williams is a naval veteran of World War II and served on convoy destroyers. He was discharged in 1945 with the rank of lieutenant-commander.

**HAYES MC COY,** counsel for Cities Service Oil Co. (Del.), has retired after 36 years of service. He joined Cities Service in 1916 and served on its legal staff at Bartlesville, Okla., until 1947, when he was named corporate counsel. He is a charter member of the Mid-Continent Oil & Gas Association and has served almost 20 years as a member of the general Mid-Continent Oil & Gas Assn. legal committee, the last 15 years as chairman. Mr. McCoy is also a charter member of the Osage Oil & Gas Lessees Assn. and served as its president for eight years.

**A. G. STEWART** has been appointed superintendent of Imperial Oil Company's new refinery at Winnipeg which went on stream last summer. Mr. Stewart joined the Imperial laboratory at Calgary in 1930 and was promoted to junior chemist in 1935. He held various other positions in the Calgary refinery including that of assistant superintendent during the war. In May, 1951, he was transferred to Sarnia as supervisor of the operations analysis group and a year later received his present appointment.

**S. G. COULTIS** has retired as general manager and vice president of The Imperial Pipe Line Co. after 35 years in the oil industry in Canada. He was engaged in field operations in Turner Valley, and when the Royalite Oil Co. was formed in 1921, he was its first employee and eventually a director. He also played a leading role in setting up the Valley Pipe Line Co. which built the Calgary-Turner Valley pipe line for transportation of crude oil. He was president and general manager of that company until his transfer to The Imperial Pipe Line Co. in 1949.

**E. W. CHRISTIAN,** formerly assistant general manager of The Imperial Pipe Line Co., has been appointed general manager to succeed S. G. Coultis, retired. He joined Imperial in 1936 and was transferred to South America the following year. After working in Peru and Colombia, he returned to Canada in 1948. During the next few months, he was engaged in construction in Montreal East refinery and the general engineering and development department in Sarnia, and in the fall of 1948 transferred to The Imperial Pipe Line Co. at Edmonton.

**A. B. MC DANIEL** has been appointed assistant general sales manager for Baroid Sales Division, National Lead Company. Well known throughout the oil industry, Mr. McDaniel has been with the Baroid organization since 1935. Prior to this, he was associated with the Standard Oil Co. of Bolivia and the Phillips Petroleum Co. He has served as service engineer and district superintendent and has been distribution manager for Baroid since 1948.

**CARL E. KLEIBER** and Frank T. Barr have been appointed senior engineering associates and Maury Lapeyrouse senior research associate of Standard Oil Development Co. The appointments are in recognition of outstanding work.

*P. Montgomery*

**PHIL MONTGOMERY** has returned to the Halliburton Oil Well Cementing Co., Duncan, Okla., after a year with the Petroleum Administration for Defense in Washington, D. C. He was previously manager of Halliburton's mechanical research and development department and now has been named technical coordinator for cementing services, a new position. He is attached to the staff of William D. Owsley, Halliburton vice-president for engineering advice to management.

**C. C. BANKHEAD** has joined the staff of Avila Oil Co. at Fort Worth. Mr. Bankhead was with Shell Oil Co. from 1933 to 1946 as exploitation engineer and subsurface geologist, and since 1946 has been consulting geological engineer. The Avila Oil Co., with offices in Continental Life Building, Fort Worth, Texas, was organized in May of this year, with Chester M. Crebbs, president. Mr. Crebbs retired as president of Mene Grande Oil Co., Caracas, Venezuela, July 1, 1949.

**EDWIN F. NELSON** has been elected president and general manager of the Lake Superior Refining Co., Superior, Wisconsin. Officers re-elected at the meeting of the board were: H. J. Underhill, vice president; R. A. Crawford, secretary; and Leslie Olsen, treasurer.

Lake Superior Refining Co. is located at the extreme eastern terminus of the 1,100-mile Inter-Provincial pipe line. Currently the refinery is processing Redwater crude oil and has a rated capacity of 4,000 barrels per day. Present facilities include reforming, cracking, and crude distillation. Members of the board have approved equipment to produce asphalt of various grades, and for additional tankage to permit a more flexible operation.

**P. M. BROACH** has been named assistant manager in charge of crude oil purchases, sales, and exchanges in Sunray Oil Corporation's sales division headed by A. V. Murray. W. H. Carruth has been made assistant manager in charge of pipe line product sales. Carl A. Lemon is assistant manager in charge of tank car product sales, and P. C. Walter, assistant manager in charge of liquefied petroleum gas and special naphtha solvent sales. Sunray's traffic section, which serves all units of the sales division, is headed by S. G. Barrington, manager, and J. D. Dunning Jr. is assistant traffic manager.

**A. F. POTTER,** district manager of the Gas Service Co. in Bartlesville since 1928, became national accounts special representative with the marketing division of Cities Service Oil Co. (Del.) on Nov. 1. George H. Jenkins, district superintendent for the Gas Service Co., succeeded him as manager.

**EUGENE HOLMAN,** president of Standard Oil Co. of New Jersey, has been selected as the recipient of the first annual State Fair of Texas "Texan of Distinction" Award. The presentation was made at a banquet on Oct. 7 at which Mr. Holman spoke.

*H. L. Geis*

**HAROLD L. GEIS,** formerly division geologist for Barnsdall Oil Co. and more recently with the R. B. Mitchell Co., has opened offices in the Esperson Building, Houston, Texas, as a geological consultant. Mr. Geis has been active in Gulf Coast geology since 1935, when he was first employed by the Shell Oil Co. He spent the years 1939 to 1941 with the Atlantic Refining Co. studying surface and sub-surface geology in Cuba.

**WALTER E. BLACK,** manager of the Pennsylvania division of Esso Standard Oil Co. since 1945, will retire in February, 1953, after nearly 50 years. He will be succeeded as manager by Jesse F. Dixon, formerly assistant division manager in New Jersey. Mr. Black started as an office boy in the company's Baltimore, Maryland, office. He was chairman of the Oil Industry Information Committee, Middle Atlantic district, of the American Petroleum Institute in 1950 and 1951, and was vice chairman of the National Oil Industry Information Committee.

They have relied on Rope

The change from sail was cautious. Auxiliary Canvas supplemented the doubtful reliability of power, but the men who manned the ship still put their trust in Gourock ropes—the same reliable ropes that ships carried before the days of steam. To-day, as 200 years ago, men who "know the ropes" specify Gourock ropes. They know they can rely on ropes made with the inherited skill of over two centuries plus the modern production methods of to-day.

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# Oil Refinery Construction at Coryton

4,200-TON reinforced concrete caisson in position at Coryton after its ten mile down river journey from Tilbury. This structure forms part of the water intake jetty for the new oil refinery at Coryton under construction for Vacuum Oil Company Limited in conjunction with the Lummus Company Limited.

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# BRITISH OIL NEWS

By E. Lawson Lomax

## Revised Oil Agreement With Qatar

Petroleum Development (Qatar) Ltd., an associated company of Iraq Petroleum Co., Ltd. has completed negotiations with the Shaikh of Qatar for the modification of its concession, to introduce the 50-50 principle now generally established in the Middle East. Under the modified concession, Shaikh Ali Bin Abdullah bin Qasim al Thani will receive half the profits accruing from the operations of the company in his territory, instead of a fixed royalty as provided in the original concession.

The original concession was granted by Shaikh Abdullah bin Qasim al Thani, father of the present ruler, on May 17, 1935, for a period of 75 years. It covered the whole of the Shaikh's domain. After geological exploration, a test well was located on the Dukhan structure near the western shore of the peninsula in October, 1938, and was completed in January, 1940, at a depth of approximately 5,000 feet, where it gave an estimated initial production of 5,000 barrels a day. Two more wells were drilled before operations were suspended for the duration of the war in 1942. Operations were resumed in 1947 and the production of oil commenced in December, 1949. Production in 1950 and 1951 totalled respectively 1,700,000 and 2,300,000 tons and is now running at an annual rate of 3,000,000 tons.

## London & Overseas Freighters Ltd.

The single screw motor tank vessel "London Splendour" built for London & Overseas Traders Ltd. of London, was launched at the Haverton Hill shipyard of the Furness Shipbuilding Co. Ltd. on Sept. 22.

Her principal dimensions are:

| | |
|---|---|
| Length overall about | 592-feet 7-inches |
| Length between perpendiculars | 560-feet 0-inches |
| Breadth moulded | 80-feet 0-inches |
| Depth moulded | 42-feet 3-inches |
| Draught Lloyd's summer puboard | 32-feet 3⅝ inches |
| Deadweight about | 24,650 tons |
| Speed on measured mile trial | 14 knots |

The tank space is divided into nine triple tanks making 27 oil compartments having a capacity of 23,550 tons of oil at 50 cu. ft. per ton. All cargo tanks are fitted with heating coils.

There are two cargo pump rooms, each fitted with two duplex steam pumps 20" x 16" x 24", each capable of handling 500 tons per hour, and one stripping pump 16" x 10½" x 15".

The propelling machinery consists of a single screw Wallsend-Doxford balanced type opposed piston reversible oil engine, working on the single acting two-stroke principle with airless injection of fuel. The engine has six cylinders 670 mm. diameter and 2,320 mm. combined stroke, giving a bhp of 6,600 at 116 revolutions per minute.

## Council of British Manufacturers of Petroleum Equipment

Douglas Wilson (The United Steel Companies, Ltd.) has been appointed Chairman of the Council of British Manufacturers of Petroleum Equipment in succession to E. F. E. Howard (Hayward-Tyler and Co. Ltd.). As the nominated representative of United Steels, Mr. Wilson has a record of work for and interest in the Council going back to 1943. He was appointed vice-chairman of the council in 1951. At the end of last year, he acted as leader of the OEEC Technical Assistance Mission for the study of equipment for petroleum refineries, and spent some time in the United States.

Mr. Howard will continue in the closest touch with the Council's activities since, as immediate past chairman, he remains a member of the executive committee. The council's founder-chairman, S. T. Robson (Head, Wrightson and Co. Ltd.), has been elected to honorary membership of the council.

## New Seawater Distillation Plant for Kuwait

Acting under the instructions of His Highness the Ruler of Kuwait, Ewbank & Partners Ltd., the London firm of consulting engineers, have placed an order with G. & J. Weir Ltd., Glasgow, for the supply of sea water distillation plants to provide one million gallons of fresh water per day to Kuwait.

The plant will consist of two sets of triple effect horizontal evaporators, each set with its own distilling condenser and pre-heaters, supplying 100,000 imperial gallons of fresh water each 24 hours. The installation will be located at Shuwaikh and the fresh water produced will be for local domestic use.

The natural supplies of fresh water in Kuwait are so meager as to be almost non-existent, and this new source of supply, the cost of which is covered from oil royalties, is another proof of the benefits which the inhabitants of this arid region will derive from the exploitation of its vast oil deposits.

## Isle of Wight Drilling

Drilling for oil by the D'Arcy Exploration Co. (the Anglo-Iranian Oil Company's prospecting subsidiary) began near Arreton, Isle of Wight, England, on Oct. 1. This will be the first oil well to be drilled on the Isle of Wight.

## London & Thames Haven Oil Wharves, Ltd.

Directors of London & Thames Oil Wharves Ltd. have declared an interim dividend of five percent less tax, on the ordinary capital of £1,300,000 payable on Nov. 7 to shareholders registered on Oct. 10. Payment of an interim dividend is to conform with the wishes of certain shareholders and is not an indication of an increased distribution for the year, directors said.

## Trinidad Petroleum Development Co. Ltd.

Directors of Trinidad Petroleum Development Co. Ltd. are recommending payment of a final dividend on the ordinary stock of 12¾ percent-actual (7.65 pence per 5/—unit) free of income tax, making 16½ percent for the year ended July 31, 1952. This is the same rate of tax free dividend as paid for each of the five preceding years.

## London Tanker Brokers' Panel

At a meeting of the London Tanker Brokers' Panel held recently, the Timecharter rate as applicable on Oct. 1, 1952 for a motor-tanker of 12,000 dwt, having a speed of 11 knots on 13 tons of oil, for a period of two years, was awarded at 42s. 3d. per dwt per month.

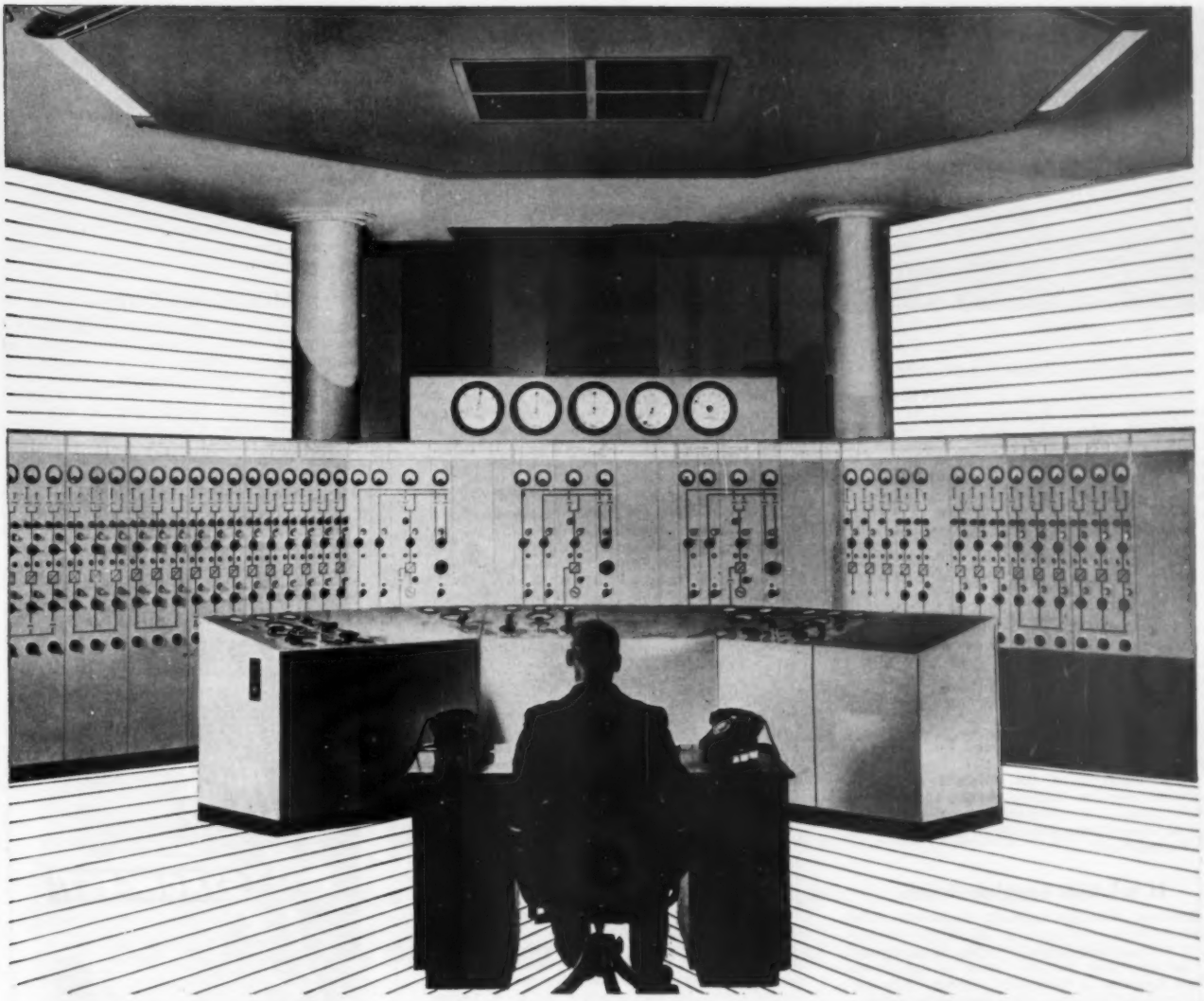
## Anglo-Iranian Oil Co. in Australia

The Anglo-Iranian Oil Co. has purchased the Australian government's holding in the Commonwealth Oil Refineries Ltd. Over half of the shares was held by that government. Included in this deal is the Laverton refinery and various ocean and other storage and distribution installations. These stations will be used to handle the products of the new refinery of the Anglo-Iranian Oil Co. at Kwinana near Fremantle, Western Australia, construction of which commenced on Oct. 1, 1952.

It is expected that construction will be completed late in 1953 and that the cost will be about 40 million Australian pounds. Its projected capacity is 3,000,000 tons per annum of Middle East crude oil, which will be about 40 percent of the continent's oil requirements. It will be the largest refinery in Australia.

Simultaneously, a program of housing and the dredging of Cockburn Sound to provide the necessary approach by tankers will be put in hand by the Western Australian authorities.

*Artist's impression of the proposed Kwinana refinery to be built at Cockburn Sound near Fremantle, Australia.*



*The Control Room of the Power House in Anglo-Iranian's Refinery at Grangemouth, Scotland.*

ANGLO-IRANIAN OIL COMPANY, LTD., with its subsidiary and associated concerns, is one of the largest oil companies in the world.

Its principal sources of crude oil production are in the Middle East. Through its prospecting subsidiary, the D'Arcy Exploration Company, it is interested in oil-bearing territories in many other parts of the world.

The Company operates refineries in Great Britain, France, Belgium, Germany, Italy, Israel and Australia. Distribution and marketing of oil products are effected both by the Company itself and through various associated companies throughout the world. For sea transport its shipping subsidiary, the British Tanker Company, operates one of the largest fleets of ocean-going tankers. The Company's principal research establishments are in Great Britain, at Sunbury in Middlesex, and at Kirklington in Nottinghamshire.

THE BP SHIELD IS THE SYMBOL OF BP THE WORLD-WIDE ORGANISATION OF

# Anglo-Iranian Oil Company

LIMITED

REPRESENTATIVE IN U.S.A.: W. D. HEATH EVES, 610 FIFTH AVENUE, NEW YORK 20, N.Y.

*George Noble*

*Dr. Frank Mayo*

*D. A. C. Dewdney*

## Australian Tanker Launched

Of particular interest to Australia is the launching of the 13,000-ton tanker "Harold Sleigh," from the Blythswood Shipbuilding Co. Scotstoun, Clyde on Sept. 26. This vessel has been built to the order of H. C. Sleigh Ltd. of Melbourne, and will be used by that company for the importation of petroleum products from overseas refineries.

The tanker, which is named after the founder of the firm, will cost approximately £800,000. She is equipped with the most modern navigational aids, including radar and echo sounding devices.

An interesting feature is that the vessel's diesel engines will be built to burn heavy bunker fuel rather than the more highly refined marine diesel oil, which has, in the past, been used in this type of engine. This is a comparatively modern development, and provides considerable economy in fuel costs. The 3,600 hp diesel engines are of Burmeister and Wain design, and are being built by Kincaid and Co., Greenock, Glasgow.

Cargo capacity of the "Harold Sleigh" is approximately four million gallons of petroleum products and it is anticipated that she will average six round trips annually from Australia to the Persian Gulf.

## H.N.L.C.E. Casel de Wilde

Heudrick Nicolaas Lodewijk Christoffel Eliza Casel de Wilde died on Aug. 28, 1952 at the age of 61 after a long illness. He had been engaged in the petroleum industry since he joined the Astra Romana in Romania in 1914. His primary interest for many years was in the development and application of oil field equipment as a member of the staff of N. V. de Bataafsche Petroleum Maatschappij and of Shell Petroleum Co. In 1946 he took complete charge of the purchase of all the British made drilling production equipment used by the Royal Dutch/Shell Group. Here he made the remainder of his career.

During this period he took an outstanding part in the development of the manufacture of drilling and production equipment in the U.K., which before the war had been on a comparatively small scale, but which had risen by 1951 to a total of nearly £9¼ million per annum.

## H. S. Humphreys

Herbert Septimus Humphreys, 62, chief engineer superintendent of the British Tanker Co., shipping organization of the Anglo-Iranian Oil Co. Ltd., died Sept. 5 at a London hospital. Joining the Atlantic Transport Line as a junior engineer in 1910, he was commissioned in the Royal Navy as an engineer lieutenant in June 1916, and was demobilized in 1919 with the rank of Lt. Commander, subsequently joining the staff of Lloyd's Register of Shipping. He entered the British Tanker Co. as assistant engineer superintendent in 1921 and became chief engineer superintendent in 1942.

## Vickers Ltd.

The Viscount Knollys has been appointed an additional member of the board of directors of Vickers, Ltd.

## Personnel

The board of Esso Petroleum Co. Ltd. announces the appointment of Norman P. Biggs as director to take effect Sept. 1, 1952. Mr. Biggs joined the Bank of England in 1927 when 19 and remained there in various capacities until 1946, when he joined Kleinwort Sons & Co. Ltd., merchant bankers, becoming a director the following year. He resigned this directorship to take up his new appointment.

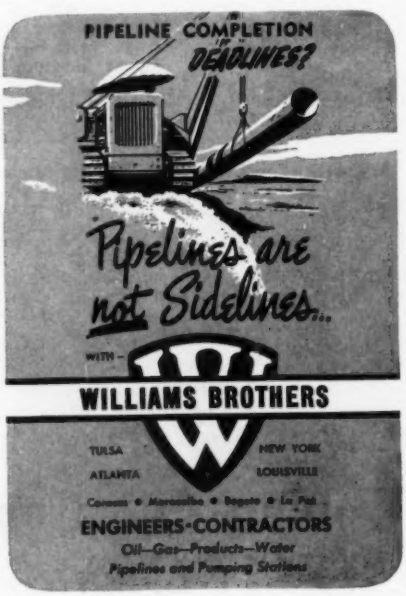
Howard Page resigned as director of Esso Petroleum Co. on Sept. 1 to assume additional duties for the Standard Oil Co. (N.J.) in relation to European problems. He still retains his position as shareholder's representative for Standard in the United Kingdom.

Several new appointments at the Fawley refinery were made by Esso Petroleum Co., Ltd.

George Noble relinquishes his post as refinery manager to become general manager of refining at the company's head office in London. He is succeeded by Dr. Frank Mayo, formerly assistant refining manager. Dr. Mayo has been actively concerned with the refining side of the industry for the past 17 years at the old Fawley refinery. Prior to the opening of the new refinery, he was assistant general superintendent and was in charge of all training of personnel.

He is succeeded as assistant refinery manager by D. A. C. Dewdney. His association with the Esso organization dates from 1936, when he joined the International Association (Petroleum Industry) Ltd. after several years as a refinery chemist in the Middle East.

During the war he served with the R.A.F. as Staff Officer, Directorate of Bombing Operations at the Air Ministry with the rank of Wing-Commander. He was awarded the U. S. Legion of Merit.



## Vacuum Oil Co., Ltd.

J. C. Gridley, chairman of Vacuum Oil Co., Ltd., has been elected director and chairman of Vacuum Oil Co. (Ireland) Ltd. Messrs. H. W. Roche, C. Lawsu, and C. G. Reeves have retired as directors of Vacuum Oil Co. (Ireland) Ltd. Mr. Reeves is succeeded as director and manager by G. B. F. Cousens, until recently automotive lubricants manager of the Vacuum Oil Co., London.

J. P. Reihill, a director of many important Irish companies, has joined the board of Vacuum Oil Co. (Ireland) Ltd., and M. R. Tyrrell, formerly accountant and office manager, has been appointed secretary to the company.

## AIOC Enters Canada

Anglo-Iranian Oil Company Ltd., through its subsidiary, the D'Arcy Exploration Co., plans to make an extended survey of the Canadian oil situation. J. W. Jackson has been sent by London to set up an office at Calgary. Mr. Jackson was among the last of the company's British staff to leave Iran when Anglo-Iranian's properties were seized last year. Until then he was superintendent of southern areas, which included Agha Jari, the 310,000-barrel-a-day oilfield which ranked as the company's biggest in Iran.

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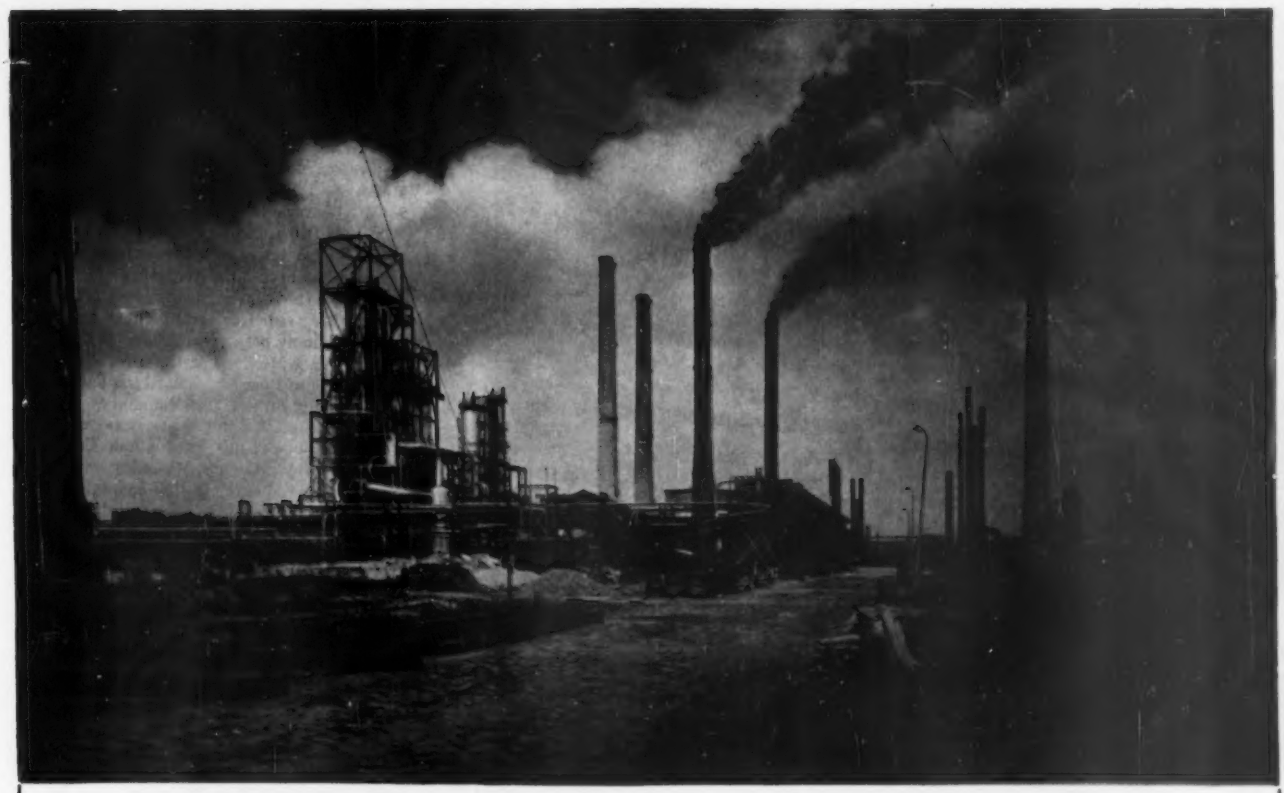

**They had a problem...** When World-War-Number-Two laid waste many of the largest Oil Refineries in Europe, it also left the world pitiably short of new or replacement plant. In fact Global disruption was complete. Oil Companies were hard put to know where to turn for supplies of more and yet more refining plant. Their normal sources of supply — although working at fever pitch, were still saturated with orders that would take years to complete. But the need for plant was urgent. The Royal Dutch/Shell Group solved their problem, in part, when they turned to Harveys. For Harveys have one of the most modern and fully equipped works in the world for the fabrication of all kinds of heavy and light plant for the Oil and many other Industries. **In fact Yours the problem – Harveys the answer!**

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## The Powder River Basin

*(Continued from page 84)*

area Steelco Drilling Co. drilled a discovery well in 1949 which found oil in both Muddy and Dakota sands. In 1950 the South Glenrock field was discovered, and Far West Oil, Hancock Oil, and Continental have been active in a development program in the area since that time. These discoveries have proved of considerable significance, with stratigraphic trap reservoirs producing both from Muddy and Dakota over a wide area of the Deer Creek valley south of the town toward the basin's Casper Mountain southern boundary.

Early in 1952 a discovery was made in the Shannon sands in the Ash Creek area of Sheridan County, Wyoming, marking the first production in that county, and the first Powder River basin production this far north on the west side of the basin. J. Ray McDermott & Company drilled the discovery in NW NW SW 24-58N-85W, and three successful producers have followed. The Ash Creek well was on acreage farmed out from Shell Oil Co. Shell had drilled several dry holes to considerable depth in the area.

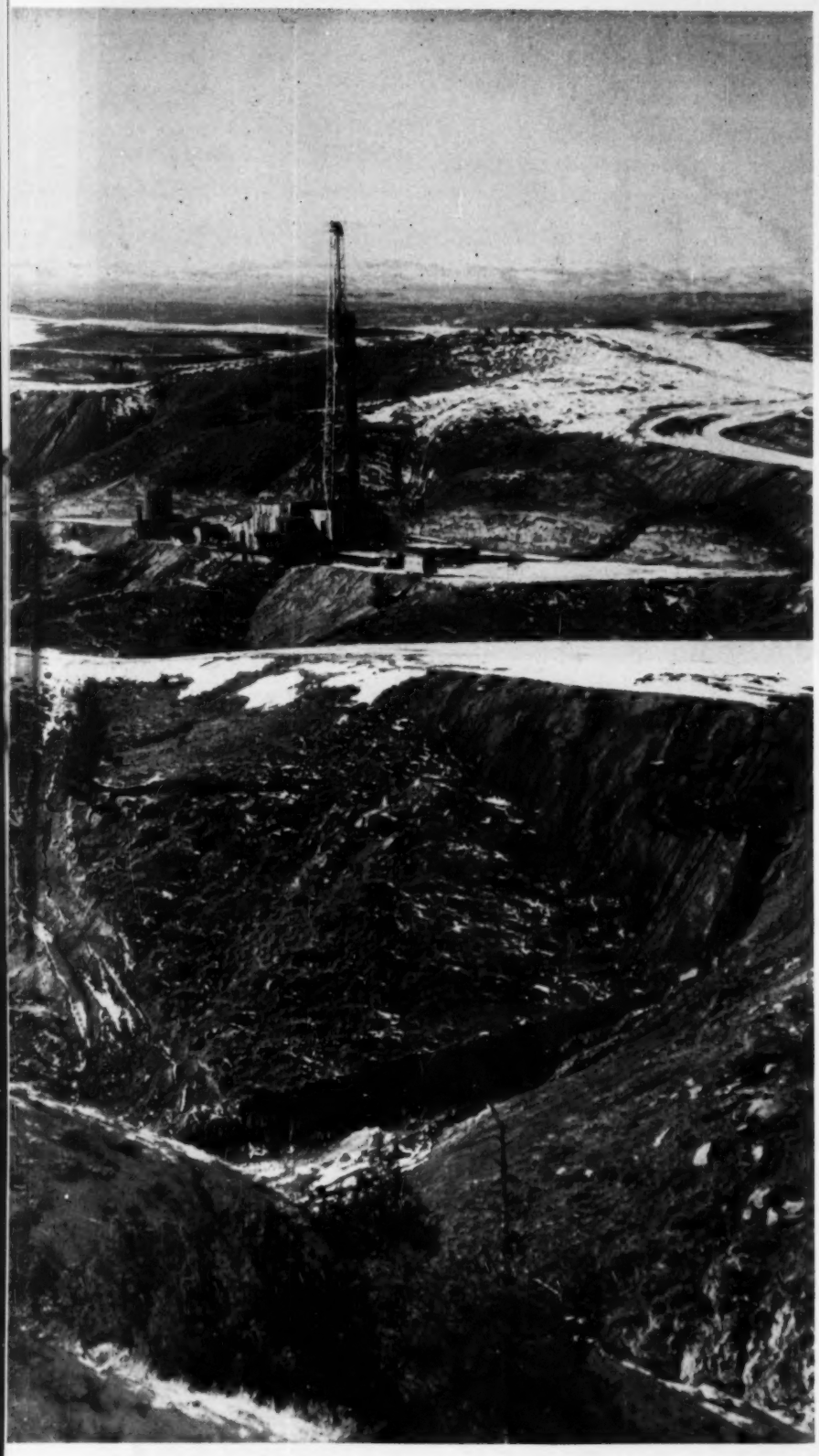
The discovery by McDermott is regarded as one of the most important discoveries anywhere during 1952, particularly due to its distance from other production (more than 100 miles), and its substantiation of prospects of production from upper horizons in many portions of the basin where conditions for stratigraphic accumulation are apparently favorable.

A furious lease play in Wyoming and Montana followed the McDermott discovery and exploration in the adjacent portions of Montana is beginning.

In September a second discovery in the northern Powder River basin brought new interest in the general area first excited by the McDermott strike. George J. Greer, Dallas independent, tested apparently commercial production of approximately 20 degree gravity oil from Tensleep in the Nine Mile area of Big Horn County, Montana, 10 miles east of the town of Hardin, and about 50 miles north of the Ash Creek discovery. The successful wildcat was the 2 Kendrick, NE NW NW 6-1S-36E, and production was from the interval 4,566-88 feet.

This success is on the extreme northwestern flank of the basin and is the first real encouragement afforded operators within the Montana portion. Extended production tests had not been made by the first of October, and definite evaluation of the discovery will necessarily await confirmation drilling.

*(Please turn to page 116)*



*Drilling rig on location in the Sussex field, Johnson County, Wyoming, in terrain typical of the field. The entire producing area is characteristically cut up and rough, but a system of excellent roads gives ready access to all locations.*

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RADORE SURVEYS,* introduced in 1950, have already proved successful in indicating directly the location of new and important mineral deposits;
TERROMETER SURVEYS,* first used commercially in 1935, have proved highly effective in mapping shallow metallic ore deposits.
For full details, direct inquiries to William M. Barret, Inc., Giddens-Lane Building, Shreveport 4, Louisiana.
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Apparently, however, the two significant northern discoveries in the basin have established a sound basis for the efforts of operators interested in the area, and indicate extended possibilities of shallow production in new areas.

The western portion of the Powder River basin, as can be seen, has been an extremely interesting prospect over the past several years. In addition to the work which resulted in the discoveries mentioned, Carter Oil, Shell, Stanolind, several independents, and other major companies have carried on an ambitious exploration program along the west and southwest flanks of the basin, with several wells drilled on well-known prospects north of present producing areas. Interest has extended northward into Montana where Gulf Oil and Carter Oil have completed recent tests without success. Carter now has another wildcat drilling in the Montana portion of the basin. No great encouragement has been had in any of the Montana ventures, and the Ash Creek discovery is the biggest boost to hope of Montana production in the basin proper which has materialized to date.

The discoveries listed for the Powder River basin in renewed activity since the end of World War II have resulted in almost complete leasing of both the available lands on the flanks of the basin and the deeper portions to the center. Geophysical exploration through these areas has been at a constant high level, and has been responsible for most of the basinward discoveries. It was the basis of the drilling at Glenrock and at South Cole Creek, and has figured in location of a number of deep tests which have been drilled recently along the east-west radius of the southern portion of the basin north of these producing areas.

Carter Oil, Phillips and Superior have all been active in deep work north and east of Casper and Glenrock. Phillips has had two deep failures in this area which had slight shows but no commercial possibilities.

The central portion of the basin contains a wide area of deep sedimentary column which has not been evaluated by the drill. Particularly stirred by the discovery at Sussex-Meadow Creek and by the McDermott discovery at Ash Creek, operators are paying attention in serious manner to the deep prospects of the basin.

Only one deep producer toward the center of the basin has been discovered. The Texas Company had a small success at Adon in Campbell county, but three wells drilled after the discovery failed to confirm it, and the discovery itself has proved hardly commercial.

Twelve miles south of the Adon well Gulf Oil Corp. is now drilling a deep wildcat which has had shows in Minnelusa, with commercial possibilities existing, but not definitely established. This well, first in the general area since The Texas Co. discovery at Adon, topped Minnelusa at 9,775 feet and on test of the interval 9,775-9,800 feet made gas and oil cut mud, and 60 feet of clean oil with a low flowing pressure on 45 minute test. The operator reported the bit still in Minnelusa without further shows at the end of the first week in October. The wildcat will test Madison at about 10,300 feet.

In the Pumpkin Buttes area of Johnson County, northeast of Sussex, the Pure Oil Co. had reached 12,750 feet in an important deep test of this area by early October, and with top of Sundance reported at 11,610 feet, no encouragement had been reported. Both this and the Gulf wildcat are of considerable importance to deep programs mapped for the basin.

The significance of the basin in the future of Rocky Mountain exploration and development can be judged from the fact that the distance from production at Meadow Creek to that at Lodgepole on the east is about 65 miles. From Glenrock to the Montana border it is more than 120 air miles. This area has hardly been tested by the drill. Gravity meter and magnetometer work in the basin has indicated anomalies at depth which have reinforced the occasional optimistic predictions of "new Salt Creek fields" within the deeper areas of the basin.

The entire Rocky Mountain region in the early 1940's produced about 115,000 barrels of oil daily. By 1951 the region produced at the rate of 300,000 barrels per day. Approximately two-thirds of this total daily production comes from Wyoming, with a large part of the state's total produced from Powder River basin fields.

Early in 1951 the productive capacity of Wyoming fields was estimated at approximately 300,000 barrels daily. The development work done since that time, plus new reserves uncovered, has served to increase that estimate or at least to render it reasonable.

The bugaboo to a production from the state (and particularly from the Powder River basin) at a higher rate has been lack of transportation for moving production to markets outside the region at competitive rates.

More than a year ago the Sussex-Meadow Creek was capable of 7,500 barrels daily or better, and the wells drilled since that time have increased that potential considerably. Present production is only a fraction of this figure. In the South Glenrock field some 80 wells are capable of sustained production of 200 barrels daily or better, and many of them are limited to 75 barrels per day under present stringent pipeline take proration.

Solution to the transportation problems of crude oil from the Powder River and other Wyoming basins has repeatedly been mentioned as the spur necessary to full exploration and development of the area.

With the formation of the Platte Pipeline Co. in 1951 by Continental, Pure, Sinclair, Ohio and British-American, the solution seemed within early reach. Beginning of the 1,100 mile, 100,000 barrel per day line touched off increased development and exploratory drilling in the Big Horn and Powder River basins of Wyoming and in the Denver-Julesburg basin of Colorado and western Nebraska as had been predicted. This groundswell of drilling, with the accompanying rise in leasing, brought the activity of the Rocky Mountain region to a new peak.

*Drilling location in the North Cole Creek field, toward the southern flank of the Powder River Basin. Depths of wells in this area approximate 8,000 feet, and terrain is less rugged than that of the Sussex and Meadow Creek fields to the north.*

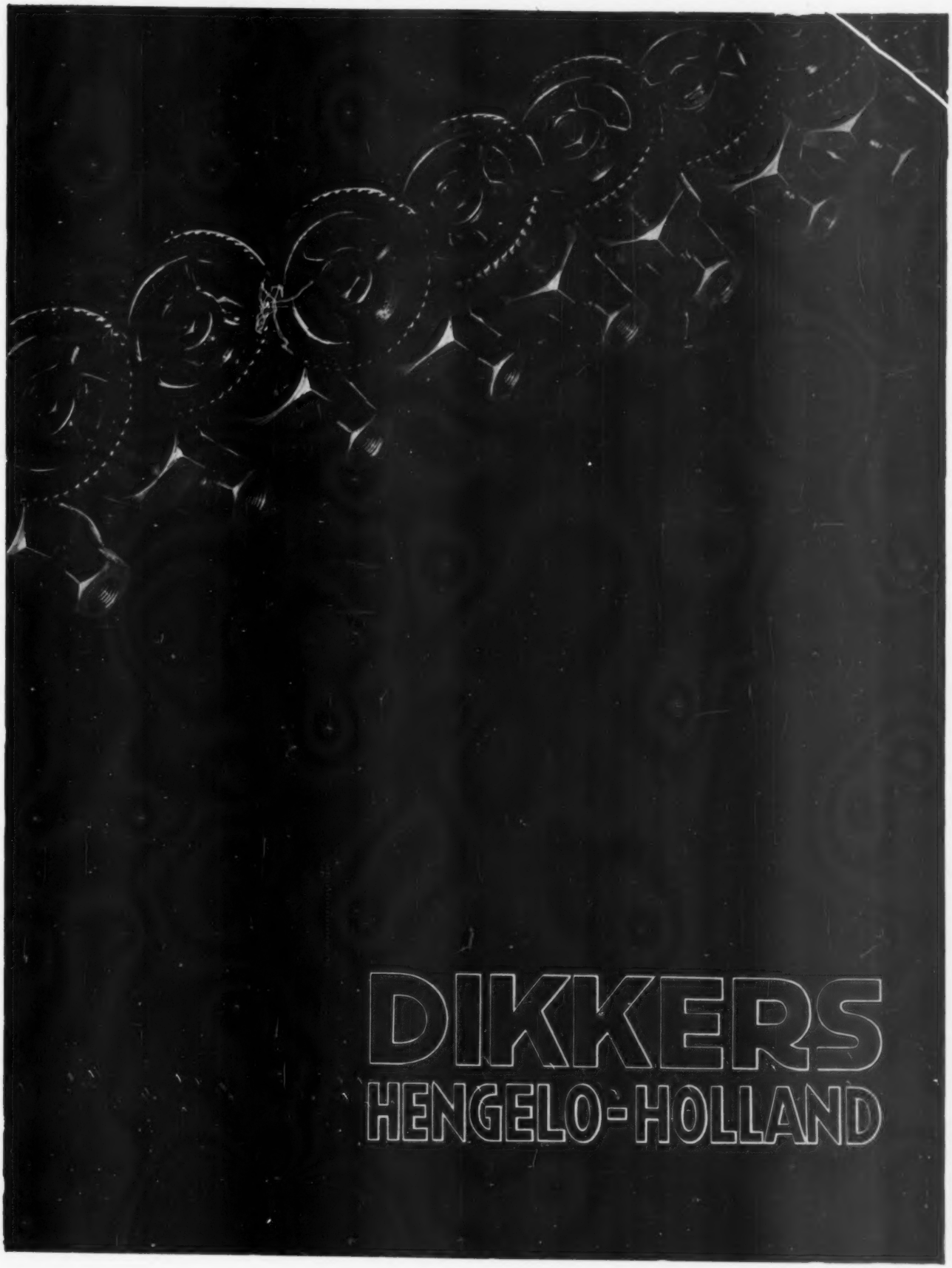
The line is nearly completed. It was scheduled for completion in August but will now be completed about November, due to the delay in receipt of steel for line pipe, a result of the recent steel strike. Less than 200 miles of the line remains to be laid.

During 1950, 1951 and 1952, the Powder River basin was leased in almost solid blocks, covering all areas which are attractive to any degree. The area has always been one characterized by rather large land plays, and blocks assembled by any company in the basin are likely to be sizeable. Majority of the acreage within the basin is public land, and lands of this basin have contributed much to record-breaking activity at the Wyoming and Montana federal land offices in recent years.

Operators who have long been active in the region hold extensive acreage within the basin. Others, both major companies and many of the nation's leading independent operators, chose the Powder River for initial lease acquisition and operations in the region.

The extensive land operations of the past several months and the pilot drilling now going on in deeper parts of the Powder River offer adequate evidence that major exploratory attention is to be given to the possibilities of deep production within the undrilled areas of the basin.

Together with the work which remains to be done on flank areas, the impending program would seem to assure the Powder River basin a prominent place in the exploratory activities of the region and the nation for some time to come.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## Exploration With Radio Waves

The current issue of *Geophysics*, journal of the Society of Exploration Geophysicists, contains an article, "Note on the Radio-Transmission Demonstration of Grand Saline, Texas," written by Wm. M. Barret, president of William M. Barret, Inc., Shreveport, La. The article discusses certain technical aspects of a demonstration to show that radio waves could be propagated from a surface transmitter to a receiver located at a depth of 700 feet in a salt mine. Results of the demonstration touched off a violent controversy among geophysicists, many of whom held that the waves could not have traveled so far through the earth, but must have reached the underground receiver by entering the mine through the elevator shaft.

Mr. Barret, in his article in *Geophysics*, presents experimental evidence to prove that the radio waves did in fact travel through the earth rather than through the mine shaft. The implications of Barret's article are of considerable importance since geophysicists in general are quick to admit that subsurface deposits are susceptible to direct location by radio waves, provided the waves can be made to travel through the earth.

Mr. Barret received his academic and pre-engineering training at the University of the South (Sewanee) and Columbia University, and was graduated from Tulane University in 1923 with a Bachelor of Engineering degree in mechanical and electrical engineering. He received his electrical engineering degree from Tulane in 1932 in recognition of in-absentia research on methods and apparatus for the determination of rock susceptibilities.

Since 1927 he has practiced continuously as a consulting geophysicist, specializing in magnetic and electrical methods of exploration. He organized the Engineering Research Corp. in 1930 for advancing the techniques and apparatus used in magnetic and electrical prospecting. In 1931

*W. M. Barret*

he organized his consulting practice under the firm name of William M. Barret, Inc., and has been president of both firms since their founding.

For the past 18 years Mr. Barret has devoted much of his time to investigating the application of radio waves to mineral exploration, and he holds about 40 United States and foreign patents and pending patents in this field. These patents form the basis for the Radoil and Radore methods, which are being sponsored by William M. Barret, Inc.

It is Barret's contention that these methods make possible the effective transmission of radio waves through the earth, and the direct location of mineral deposits at remote depths. In support of his claim of earth transmission, he shows in his article in "Geophysics" that strong signals were received in the Grand Saline mine with no more than 1.5 watts of radiated power at the earth's surface.

## Amerada To Build Williston Plant

Albert Jacobsen, president of Amerada Petroleum Company, has announced that the company will erect a large plant in North Dakota to extract gasoline and sulfur from gas produced in connection with oil development in the Williston Basin.

Determination of the exact size and location of the plant will await further information as to the extent of the area from which the gas will be produced and an estimate of its probable quantity. It is intended to place the plant somewhere near the center of production. Probable cost is put at between 10 and 20 million dollars.

Amerada made the first commercial discovery in North Dakota and has holdings of 400,000 acres in the Williston area.

## To Build Gasoline Plant

Phillips Petroleum Co. has completed plans for its new Pembrook natural gasoline plant in the Spraberry Trend of West Texas. The 60 million cubic foot plant will be located 20 miles south of the company's 150 million cubic foot Spraberry plant, now under construction. The products gathering line will be extended from the Spraberry plant to the Benedum plant, 34 miles to the north. Phillips is 50 percent owner of the Benedum plant, which will be equipped to handle 30 million cubic feet daily of additional gas from the Spraberry formation. First of the new facilities is expected to operate late this year and all others in the early part of 1953.

## New Petrochemical Plant

Carbide and Carbon Chemicals Co. will build a $36 million polyethylene and ethylene glycol plant at Torrance, Calif., on a 140-acre site adjacent to General Petroleum Corporation's Torrance refinery. General Petroleum will supply raw materials under a 20 year contract.


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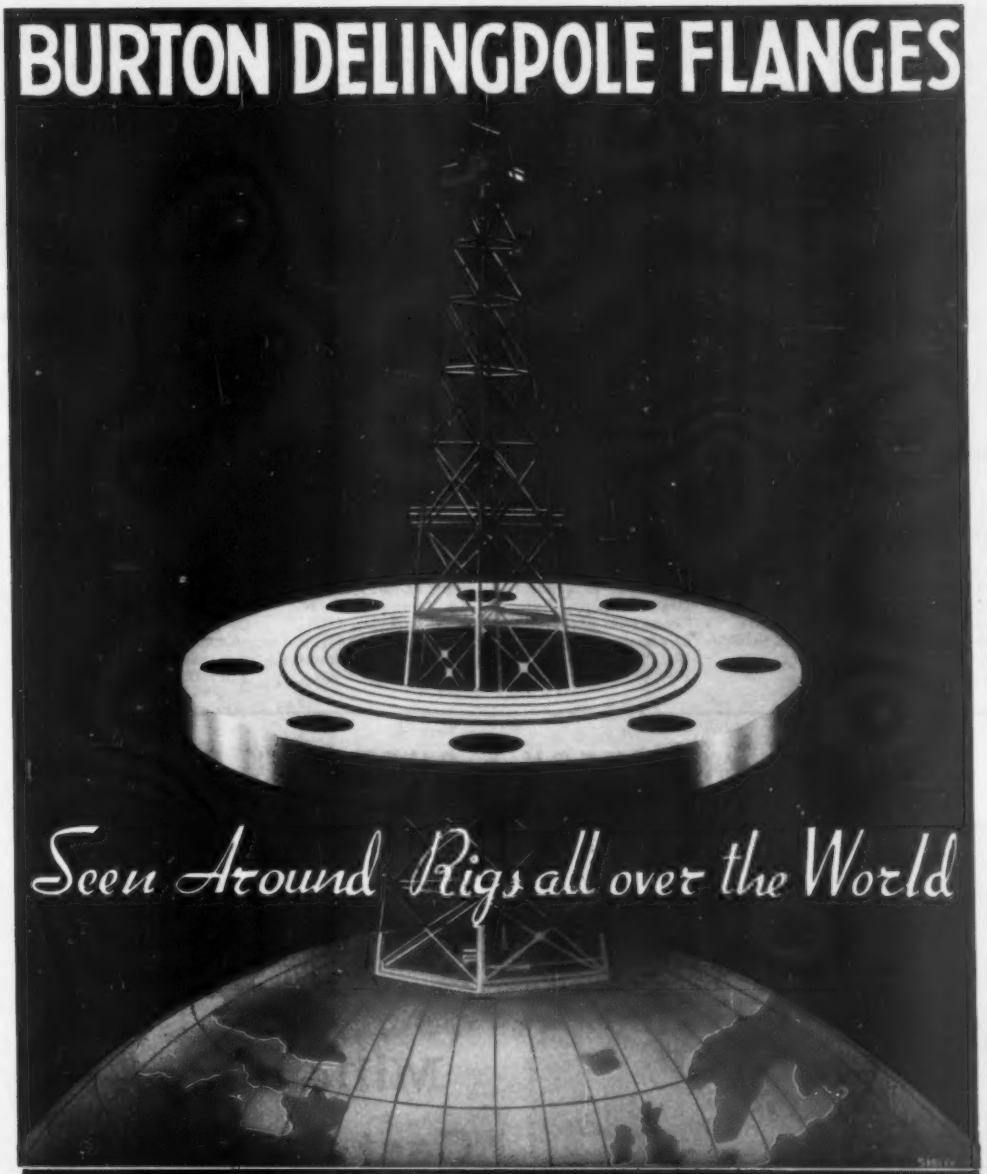

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*J. J. Doyle*

## New Baroid Distribution Manager

James J. Doyle has been appointed distribution manager of Baroid Sales Division, National Lead Co. He has served the company as development engineer, service engineer and purchasing agent.

## Hortonsphere Booklet

Chicago Bridge & Iron Co., Chicago, Ill., has recently issued an 8-page booklet, "The Hortonsphere," which describes the advantages of storing highly volatile liquids and gases under pressure.

Tables of sizes are included in the booklet. Hortonspheres for the storage of liquids range in capacity from 1,000 to 30,000 barrels for operating pressures of about 30 to 215 pounds per square inch. Hortonspheres for gas storage have been designed in standard sizes from 32 to 80 feet in diameter for operating pressures of 30 to 150 pounds per square inch.

## McKee Forms Canadian Company

Arthur G. McKee & Co., Cleveland, has opened offices of a Canadian subsidiary, Arthur G. McKee & Co., of Canada, Ltd., at 350 Bay Street, Toronto, Ont., under the direction of Ralph Westervelt. Mr. Westervelt is a native Canadian with 23 years of specialized experience in the field of engineering.

The new Canadian engineering company, which was organized on July 2, 1952, will specialize in the design, engineering and construction of petroleum processing facilities, blast furnaces, open hearth shops, rolling mills, ore preparation and treating plants and related facilities. Directors of the new company are H. E. Widdell, H. R. Moorhouse, Myran J. Livingston and Merrill Cox.

Mr. Widdell is president of the Canadian subsidiary. He has stated that all services and facilities of the American organization will be available in Canada through the subsidiary which now has in process two blast furnaces, an open hearth shop and a sintering plant.

## Rejoins Cyanamid

G. L. Glespen, who held the post of chief of the chemicals, containers and packaging branch of the Petroleum Administration for Defense during a ten months' leave of absence from American Cynamid Co., has returned to the firm's New York office as assistant to the manager of the petroleum chemicals department. Before leaving for his PAD assignment, Mr. Glespen was technical supervisor in the same department.

## Schlumberger Promotions

Schlumberger Well Surveying Corp. has appointed F. H. Yeargers manager of its Louisiana Coast division at Lafayette, La., to succeed W. W. Goode who has been transferred to Tulsa, Okla., as assistant to the Mid-Continent area manager. Mr. Yeargers has been district manager at Harvey, La.

*T. M. Johnston*

## Johnston Testers Elects

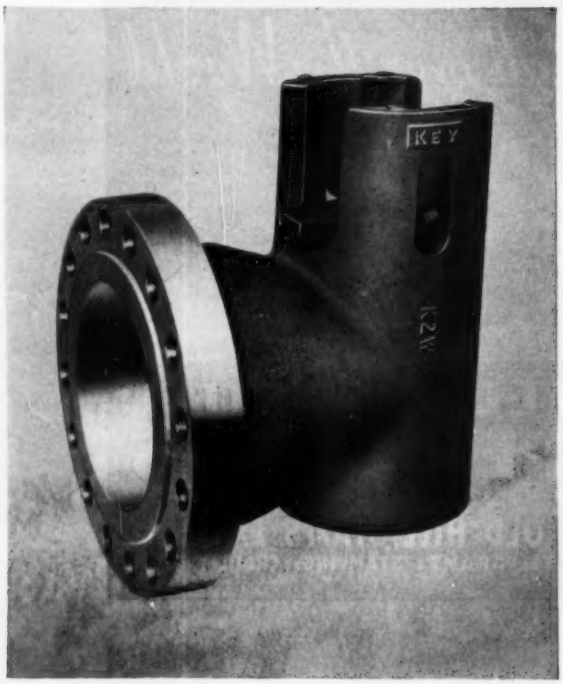
T. M. Johnston has been elected executive vice president of Johnston Testers, Inc., and is transferring his offices from Los Angeles to company headquarters at Houston. He will also serve as assistant to W. B. Taylor, company president.

Mr. Johnston has been a vice president of the company since it was organized in 1951 to purchase four companies formerly owned and operated by M. O. Johnston. At that time he was general manager of the Rocky Mountain and West Coast divisions.

## Cooling Tower Catalog

A new illustrated 36 page catalog on cooling towers has been issued by the Foster Wheeler Corp., New York. The booklet contains details of construction, charts, suggestions on recirculation, and surroundings. It also includes an "Inquiry Data Sheet" for planning requirements.


FOR OIL REFINERY & CHEMICAL PLANTS

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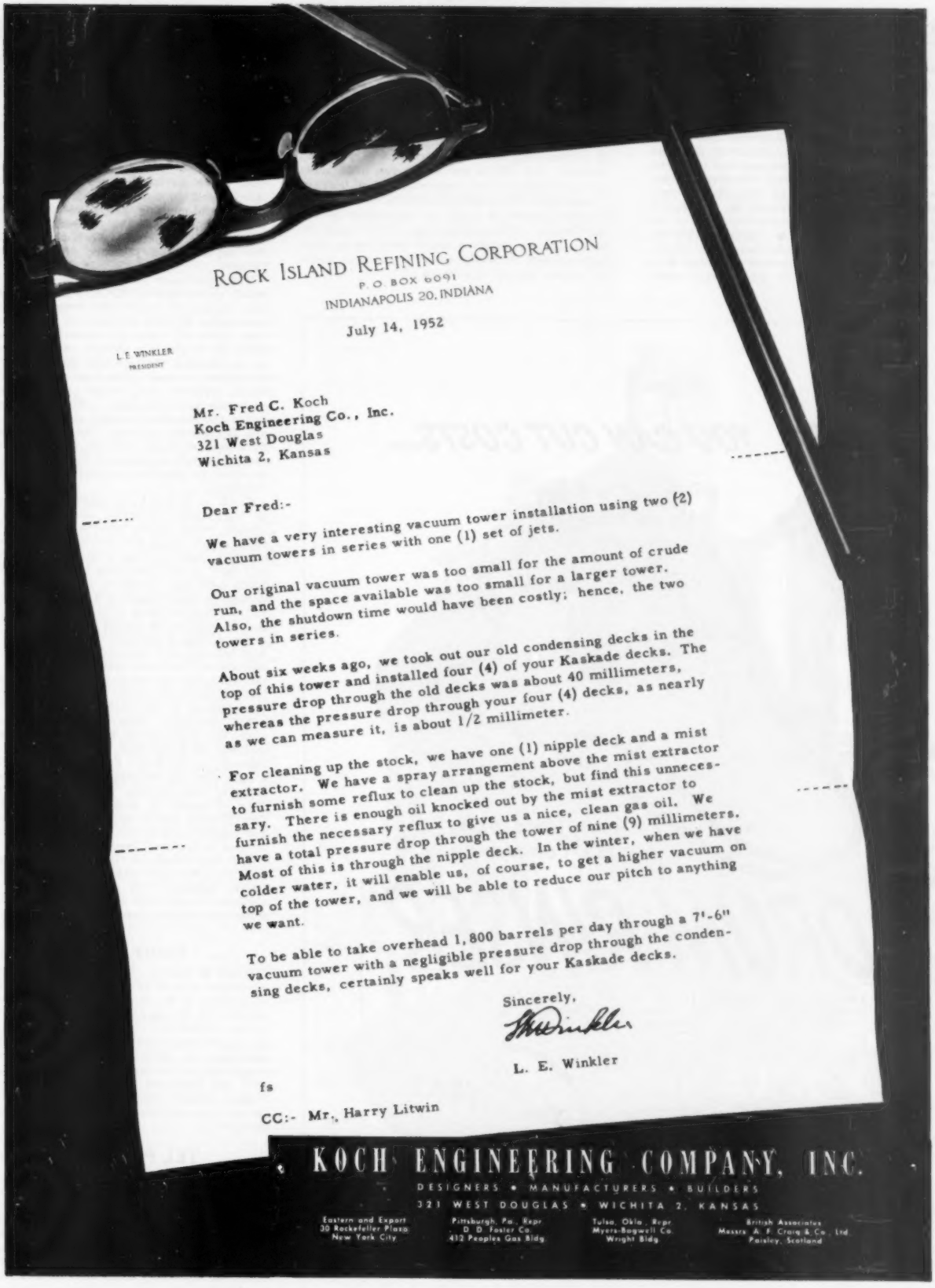

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INDIANAPOLIS 20, INDIANA

July 14, 1952

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PRESIDENT

Mr. Fred C. Koch
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We have a very interesting vacuum tower installation using two (2) vacuum towers in series with one (1) set of jets.

Our original vacuum tower was too small for the amount of crude run, and the space available was too small for a larger tower. Also, the shutdown time would have been costly; hence, the two towers in series.

About six weeks ago, we took out our old condensing decks in the top of this tower and installed four (4) of your Kaskade decks. The pressure drop through the old decks was about 40 millimeters, whereas the pressure drop through your four (4) decks, as nearly as we can measure it, is about 1/2 millimeter.

For cleaning up the stock, we have one (1) nipple deck and a mist extractor. We have a spray arrangement above the mist extractor to furnish some reflux to clean up the stock, but find this unnecessary. There is enough oil knocked out by the mist extractor to furnish the necessary reflux to give us a nice, clean gas oil. We have a total pressure drop through the tower of nine (9) millimeters. Most of this is through the nipple deck. In the winter, when we have colder water, it will enable us, of course, to get a higher vacuum on top of the tower, and we will be able to reduce our pitch to anything we want.

To be able to take overhead 1,800 barrels per day through a 7'-6" vacuum tower with a negligible pressure drop through the condensing decks, certainly speaks well for your Kaskade decks.

Sincerely,

L. E. Winkler

fs

CC:- Mr. Harry Litwin

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## Comment On Fuel Outlook

A reader has written expressing disagreement with some of the basic facts in an article on distillate fuel supplies published on Page 40 of the October number of WORLD PETROLEUM. He is optimistic about the adequacy of supplies for the coming heating season but does not agree that temperatures during the past four years have been somewhat below normal. He wrote as follows:

"Now it may be true that if you take the recorded temperatures for a number of locations, the arithmetic average would indicate that winters were colder than normal. However, if you were to weigh the variations from normal temperatures in those areas where the heating oil demands are heavy, you would find that the burden on the oil industry to supply heating oils was much lighter than would have been experienced if normal temperatures had prevailed. This is particularly true in the East Coast states where the winter temperatures have not been below normal, and according to our calculations, the recorded degree days were 6.5 percent below normal. This is one of the reasons that no difficulty was experienced in supplying the Eastern markets.

"Further on in your article you discuss the facts related to sales of new burners and you arrive at a figure of burners in use at the end of 1952, 616,000 more than at the end of 1951. As we study the figures, this increase was obtained by taking the 700,000 new burners, less 12 percent required for replacement of worn out burners. We fail to see where you have made any allowance for the replacement of oil burners by gas units which are reported by Bob Gray to be about 51,000 in 1951, and according to our calculations might approximate 65,000 units in 1952. The consumption would then be, on your basis of unit consumption of 39 barrels, some 2.5 million barrels of heating oil."


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## Sarpom Serves Italy

*(Continued from page 79)*

to tie up for unloading at the terminal's old pier. The two 10-inch unloading lines on the pier were tied together to handle the crude being discharged from the tanker.

When the refinery is placed in operation on a regular basis, it is contemplated that larger tankers will be used to bring in Middle East crude and a submarine unloading system has been built to obviate the necessity of extensive harbor dredging to accommodate the large tankers. The new 14-inch unloading line and a four-inch water service line are laid beside the old pier extending more than half a mile into the bay where mooring buoys are anchored. Unloading capacity of the submarine system will be about 7,000 barrels per hour, depending on the capacity and pressure of pumps on the tankers.

The crude pipe line laid from the Savona terminal to the new SARPOM refinery is the first such system of considerable length to be laid in continental Western Europe. It is an 8-inch line laid across 97 miles of somewhat difficult terrain. It crosses the sharply scarped Appenines at an elevation of about 1,600 feet and the highly developed lowlands with their system of highways, railroads and canals. Some 164 canal crossings were necessary. There were also 66 rivers and streams, 32 highways and lesser roads and 22 railroads to cross. The line also traverses 33 municipal areas. It was necessary to cross rice and other agricultural lands at off seasons in order to interfere as little as possible with farming.

Crude is moved by a single pumping station, at the marine terminal, provided with three electric motor driven pumping units of 190 hp each, which gives the station the approximate capacity, under average conditions, of 18,000 barrels daily at the maximum pumping pressure of about 1,400 psi. Capacity of the line can be increased to about 24,000 b/d by the installation of an intermediate pump station if it becomes necessary to enlarge the refinery.

For corrosion protection the line was coated with bitumen and wrapped with Fiberglas. Seven cathodic stations were installed on the line. Special wrapping was employed at stream crossings. Italian contractors built the whole line and pipe was supplied by the Italian firm Dalmine.

FM shortwave radio connection between refinery and terminal has been provided, with three stations, 50 watts each, at the terminal, at the refinery, and at Monte Begua (repeater stations), a high point on the Appennine Mountains about 10 miles from Savona, and from which there is "line of sight" to both terminal and refinery. Two 20-watt mobile sets are provided for pipeline maintenance crews. Teletype machines will be used to transmit messages.

The new SARPOM refinery is an important addition to the post-war building program of the Italian industry. Its strategic location in the industrial north will contribute greatly to the prosperity of the nation.

## Henry M. Dawes

Henry M. Dawes, 75, chairman of the executive committee of Pure Oil Co., died Sept. 29. He had been active in the oil industry since 1906 when he joined with Beman G., Rufus C., and Charles G. in the formation of Dawes Brothers, Inc. Like his late brother Charles G. Dawes, Henry M. was interested in national affairs. He served as comptroller of currency of the United States in 1923 and 1924 and later was a member of the Federal Reserve Board. He was a director and former vice president of the American Petroleum Institute.

## TEL Pioneer Retires

One of the world's foremost authorities on the manufacture of tetraethyl lead, Joseph L. Stecher, assistant director of sales of duPont's petroleum chemicals division, has retired after a 37-year career with the company. He had been connected with tetraethyl lead production and sales almost continuously since 1923, the year the first tetraethyl lead anti-knock compounds for gasoline were marketed.

## New Bridge Plug

By utilizing new developments in metallurgy, explosives, and electronics, a new simplified bridge plug has been developed by the McCullough Tool Co. The new McCullough explosive-expansion electric wire line bridge plug, called the Type "B," is as different in design, when compared with the common slip-packer type plug, as this plug is different from earlier versions designed by the driller.

Control to set the bridge plug is operated from the surface. It is run in the well on the regular electric wire line operated from the McCullough service truck. A prescribed amount of explosives, which is determined by plug size, size and weight of casing, and hydrostatic head, is pre-loaded in the plug. The plug is lowered to the desired setting location, the safety devices at the surface are actuated, and the explosive is ignited by an electrical impulse through the electric wire line. The explosive force expands the plug sufficiently to lock it tightly in the casing, providing a positive metal-to-metal seal.

A strong upward pull on the line releases the setting tool. The setting tool is raised 15 or 20 feet, then lowered until it again contacts the plug to double check the setting location.

The Type "B" plug has provided a positive seal, both up and down, under all types of well and casing conditions—including pipe under tension, compression, 13,000 psi hydrostatic heads, cemented casings, and old and new casings of all weights. It has been hydrostatically tested with extremely high hydrostatic differential pressures. Plugs have been tested to pressures higher than the threaded joint will hold without leaking.

When the new plug is set, it places a slight stress in the pipe. It is a permissible stress that does not exceed the elastic limit of the casing symmetrically. It is no greater than applying hydrostatic heads in squeezing, setting packers, or operating other slip type tools where the packers hold a hydrostatic load. And, in addition, it completely eliminates the continuous, detrimental, outward wedging action of slip type tools. As a safety measure, a special back pressure valve permits the explosive gases to escape before the plug expands beyond the permissible stress limits.

Outside diameter of the Type "B" plug is considerably smaller than the O.D. of slip-packer plugs and much smaller than the inside diameter of the casing. This minimum O.D. provides a large bypass annulus, allowing the plug to be lowered into the well at a very rapid rate. Also, the plug passes dog legs and other obstructions where other plugs have failed, due both to its smaller O.D. and its shorter length. One or more sinker bars are used to increase the weight on the plug to permit speedier travel through heavy weight mud.

The Type "B" bridge plug is made of drillable metal of a special analysis that is highly resistant to the corrosive action of salt water and electrolysis. One major operator, using a rock bit, drilled out a Type "B" plug in one hour. Another drilled out a Type "B" plug, following an upper zone test, in 30 minutes with a used rock bit. The average drilling-out time with a regular rock bit is usually from three to five hours, depending upon the driller, equipment, etc.

## Buys Lith-O-Log, Inc.

Lith-O-Log, Inc., cutting analysis service, has been acquired by Petroleum Engineering Associates, Inc., Pasadena, Calif. In addition to the cutting analysis service, Lith-O-Log has developed a porosity-permeability-saturation unit for core evaluation and salinites at the rig site. Operations are confined to California, but proposed plans call for expansion into other oil producing areas.

## Appoints Export Distributor

Hinderliter Tool Co. division of H. K. Porter Co. has appointed Petroleum Machinery Corp. as its exclusive export representative in all foreign countries except Mexico and Canada. Petroleum Machinery, more commonly known as "Petromac," is headed by William Campbell.

## Second Sulfur Plant Operating

Phillips Chemical Co. recently began operation of its second 50-ton sulfur plant in West Texas adjacent to the company's Crane gasoline plant. Production has already exceeded the design capacity by over 10 percent. Sulfur from this plant will be trucked in its molten state to a railroad spur 38 miles away, where it will be loaded into tank cars for manufacture into ammonium sulfate at the company's Adams Terminal plant near Houston, Texas. Production from a similar plant located near Goldsmith, Texas, began in February, 1952.

## Acquires Watson-Stillman

H. K. Porter Company, Inc., Pittsburgh, has bought the Watson-Stillman Co., Roselle, N. J. Operations at Watson-Stillman will continue under the direction of Edwin A. Stillman, president.

## Erratum

In the article by Dr. Juan Rassmuss on Page 62 of the September issue, the income and capitalization of Empresa Petrolera Fiscal in Peru was stated in terms of *sucres*. The monetary unit in Peru is, of course, the *sole* and not the *sucre*.

## New Sulfur Plant

A unit which will recover up to 55 tons of elemental sulfur daily from waste refinery gases recently went into operation at the Houston plant of the Shell Chemical Corp. The new sulfur recovery unit, a necessary defense project, was constructed by the Ralph M. Parsons Co. of Los Angeles. An unusual feature of the unit is that the sulfur will be stored in molten form in an underground tank at a temperature of 300° F. It will remain in this state throughout loading and transporting in specially insulated railroad tank cars.

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## Platinum Catalyst

*(Continued from page 73)*

about 825° F. Thus, about 80 percent of the heat liberated, or 6,000,000 Btu., is converted to high pressure steam in the salt boiler which is part of the cracking unit. The balance of the heat increases the temperature of the flue gas to the gas turbine, resulting in an additional production of about 80 kw.

The yearly return of the operation, based on fuel value alone, is approximately $27,500. Since the salt circulating pump is common to the cracking unit, no additional power for pumping salt is required.

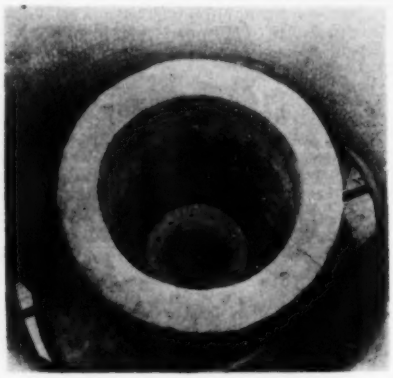
The catalytic elements have been in operation for three months and no decline of activity has been detected during this period.

The initial investment cost of catalyst was approximately $25,000 and the replacement cost $7,500. Long catalyst life is expected. In case of loss of activity by catalyst aging, or by erosion, catalyst can be easily replaced during routine shut downs. Used catalyst is revivified by reclaiming the film at the surface, and applying a new active film, thus using the support indefinitely.

Future plans on the fixed bed unit call for rearrangement of the piping to provide mixing of the two streams of flue gas and to furnish the necessary oxygen for complete oxidation of carbon monoxide and hydrocarbon vapors. Eventually a second reactor will be installed and other units equipped, including moving bed units where the carbon monoxide concentration is higher and economics more attractive.

On a typical moving catalyst unit equipped with a 20,000 cfm air blower and rejecting hot flue gases containing five percent carbon monoxide, the heat recovery of combustion plus subcooling of the gases is of the order of 25 million Btu. per hour. At current fuel cost of $2.75 per barrel and normal time efficiencies, this represents a saving of $85,000 to $90,000 per year on fuel costs alone.

Estimates prepared for a complete $107,000 installation at a large eastern refinery indicated the following unit costs: $30,000 for boiler unit, $2,500 for revamping steam drum, $5,000 for catalyst chamber, $5,000 for piping, $5,000 for supports, $30,000 for erection, and $30,000 for the catalyst. The saving there was estimated at the equivalent of $120,000 worth of steam in a year.



## New Type of Refinery Flare

Effectiveness of a highly-atomized water spray in eliminating smoke in a new ground-type safety flare was demonstrated recently at the Bayway refinery of Esso Standard Oil Co. in Linden, N. J. Constructed of three concentric masonry stacks, the largest of which is 30 feet high and 14 feet in diameter, the new flare permits the introduction of gas and water spray, combustion, and final flaring in gradual stages. Gas and water are combined in the small innermost stack. As they emerge, two pilot lights ignite the mixture for initial combustion in the second stack. The third stack affords a larger area and better draft for the final flaring, thus confining the entire operation within the flare itself.

## New Catalyst Plant

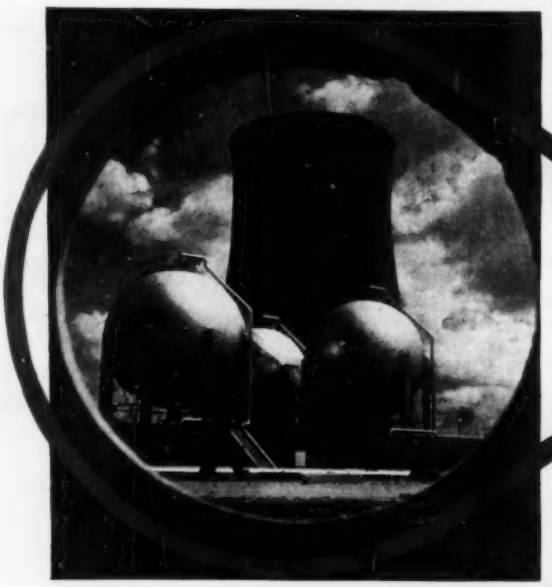
Filtrol Corp., Los Angeles, will build a new $5 million plant at Vernon, Calif., to manufacture ammonium sulfate fertilizer and high purity alumina. The alumina will be processed to produce alumina catalyst, stabilized alumina catalyst and impregnated alumina catalyst. Filtrol will market the catalysts to the petroleum and chemical industries. Shell Chemical Corp. will market the ammonium sulfate fertilizer output. Engineering and design contract has been awarded to the J. H. Pomeroy Co., Inc., of San Francisco. Completion is expected in the fourth quarter of 1953.

## Tractor Catalogs

Two catalogs have been released by the International Harvester Export Co. to describe features of diesel crawler tractors TD-24 and TD-9. The TD-24 with its 148 drawbar horsepower is suited for bulldozing, pulling or pushing earth scrapers, pipelaying, roadbuilding, and all forms of heavy construction work. More suitable for a variety of lighter tasks is the TD-9, which puts its 41 drawbar horsepower to work on such jobs as compacting and loading fill, clearing and grading, laying pipe and telephone cable, logging, and quarry work. Copies are available on request.

## Set Record Allowable for Texas

The Texas Railroad Commission has established an allowable of 3,225,415 barrels daily of crude production during the month of September, an increase of 261,201 barrels over the allowable for the preceding month. The order sets a record figure and was issued following statements by refiners that they could handle a larger output. Provision for the potential increase was made by raising the number of days of permissible operation for most fields from 20 to 22 days. The production period for East Texas is set at 19 days and various smaller fields are held in shorter periods.

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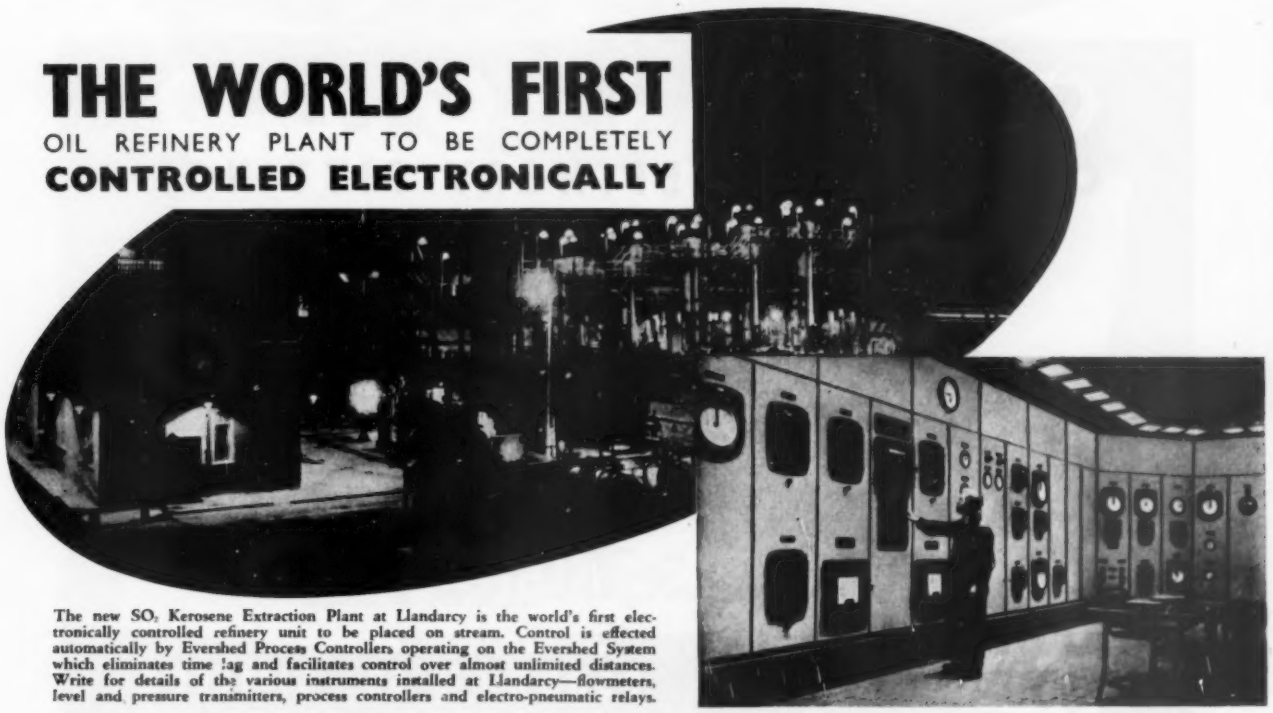

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## New Lube Processing Unit

Sinclair Refining Co. will build a $1 million propane deresining plant at its Wellsville, New York refinery. Contract for the unit has been let to The Fluor Corp., Los Angeles.

Design capacity of the unit is 700 barrels per day of Pennsylvania 600 flash steam refined stock. The cylinder stock will be separated in a primary fractionator into deresined oil and a wide resin cut. The total resin from the bottom of the primary fractionator will go to a secondary fractionator which will yield a very heavy resin bottoms and a mixed resin stream overhead. This mixed resin will be further separated into a light and intermediate product. Thus the propane unit will yield three resin streams which will range in SSU viscosity at 210°F from 500 to 30,000.

A refrigeration unit is provided for controlling temperature at the bottom of the secondary fractionator in order to make the high viscosity resin.

This unit is designed primarily for Pennsylvania Grade bright stocks, but has been so engineered that, when and if desirable, materials produced from Mid-Continent crude may also be utilized. This new unit, according to W. B. Chenault, general superintendent at Wellsville, is a distinct advance in the method of producing Pennsylvania Grade bright stocks.

For the past three months, Mr. Chenault has been busy directing operations for the clearing of the property and preparing the site for the new construction, which is expected to be completed and in operation next Spring.

## Bit Catalog

Catalog 525 dealing with Hawthorne replaceable blade bits for exploration drilling has been published by Herb J. Hawthorne, Inc., Box 7366, Houston 8, Texas. The catalog gives detailed information on bit assemblies, with prices, shipping weights, and other information about each of the types of bits and accessories. All steps involved in changing blades are illustrated by a series of photographs. Copies of the catalog are available on request.

*D. B. Ross*

## New Sawyer-Jensen Partner

Donald B. Ross has joined the Sawyer-Jensen Co. of Tulsa, manufacturers of specialized pipeline and refinery equipment. The firm name has been changed to Sawyer-Jensen-Ross in recognition of his partnership. He formerly was manager of industrial and export sales for the Kobe division of Dresser Industries. Mr. Ross will handle the promotion and sales of present products as well as work with customers to develop new equipment items for particular problems. Major emphasis will be placed on direct sales of "Shortster" side entering mixers introduced about a year ago for pipeline and refinery applications.

## Gun Perforating Folder

A new folder on Bullet Type Gun perforators has been published by McCullough Tool Co., 5820 So. Alameda Street, Los Angeles 58, Calif. The folder contains technical data, performance records, job data, and a discussion of the advantages of the simultaneous firing method of gun perforating.

## Book Review

"Mineral Forecast 2,000 A.D.," by Edward Steidle, Dean of the School of Mineral Industries; published 1942 by Pennsylvania State College, State College, Pa.; 216 pages; $3.

In this book the author accepts the idea of an ever-expanding economy of the United States, with the handicap of utter dependence on outside sources for many strategic and critical mineral supplies. In the face of this handicap there is urgent need for conservation of minerals, and a clear-cut, down-to-earth mineral policy administered by a federal department of mineral industries. In particular, each state, and especially Pennsylvania, should have such a policy for its own mineral housekeeping.

Taking account of trends in science, the author forecasts how the most will be made in the next 50 years of existing supplies of mineral fuels, metallic and non-metallic minerals and their discovery, extraction, preparation, processing and utilization. But to reach the projected goal, it will be necessary to train large numbers of students in the natures and the economics of raw materials, and he makes a strong plea for such education at State College.

## Errata

A British reader has called attention to a number of errors in the tabulation on Page 57 of the September number giving estimates of 1952 world consumption of petroleum products. Most of these are in Latin America. Mexican consumption estimate should be 74,664,000 barrels for 1952, an average of 204,000.

Percentage increases in Latin America should be as follows: Chile, 12.0; Colombia, 12.5; Cuba, 6.8; Netherlands West Indies, 4.8; Peru, 6.9; Uruguay, 4.5; Venezuela, 12.4; others, 10.1. These were badly garbled in the tabulation.

Our correspondent suggests that consumption in the U.S.S.R. is considerably higher than was shown in our tabulation. He indicates that 1951 demand should be given at about 983,000 b/d and 1952 demand at 1,042,000 b/d.

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*W. R. Hainsworth*

## Appointed Fluor Technical Advisor

William R. Hainsworth has been appointed technical advisor to executive vice president J. Robert Fluor of Fluor Corp., Ltd. Mr. Hainsworth was formerly research director and vice president in charge of engineering for Servel.

## Arc Welder Booklet

Information and engineering improvements and application refinements of the Type RA DC arc welder are offered in a new 12-page booklet available from the Westinghouse Electric Corp. The booklet reports on performance characteristics, physical construction, electrical specifications and ratings, and approximate dimensions and weights. For a copy of this booklet, B-5453, write Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pennsylvania.

## To Study Offshore Oil Prospects

Walter S. Hallanan, chairman of the National Petroleum Council, has appointed a committee on Submerged Lands Productive Capacity to study and report on the oil and gas prospects of offshore submerged lands on the basis of technological aspects only without regard to ownership or title.

The Department of the Interior's Oil and Gas Division, according to Mr. Hallanan, requested such a study, stating that the problems incident to the discovery, development and production of offshore petroleum deposits are different both in magnitude and in character when compared to operations in adjacent on-shore areas and that it is essential, therefore, that the impact of these new and different problems be studied and their effect estimated with reference to the availability of production from submerged lands.

The Committee on Submerged Lands Productive Capacity is headed by L. S. Wescoat, president of the Pure Oil Co. Others appointed to the committee are: Hines H. Baker, president of Humble Oil and Refining Co.; Paul G. Benedum, president, Hiawatha Oil and Gas Co.; Bruce K. Brown, president, Pan-Am Southern Corp.; Russell B. Brown, general counsel, Independent Petroleum Association of America; E. F. Bullard, president, Stanolind Oil and Gas Co.; H. S. M. Burns, president, Shell Oil Co.; Robert H. Colley, chairman of the board, Atlantic Refining Co.; Howard A. Cowden, president and general manager, Consumers Cooperative Association; J. C. Donnell II, president, Ohio Oil Co.; J. Frank Drake, chairman, Gulf Oil Corp.; Paul Endacott, president, Phillips Petroleum Co.; R. G. Follis, chairman, Standard Oil Co. of Calif.; B. A. Hardey, independent oil producer; B. Brewster Jennings, president, Socony-Vacuum Oil Co.; Charles S. Jones, president, Richfield Oil Corp.; Wm. M. Keck, Sr., president, Superior Oil Co.; Richard Gray Lawton, president, Lawton Oil Corp.; A. C. Mattei, president, Honolulu Oil Corp.; L. F. McCollum, president, Continental Oil Co.; N. C. McGowan, president, United Gas Corp.; S. B. Mosher, president and general manager, Signal Oil and Gas Co.; E. E. Pyles, vice-president, Monterey Oil Co.; W. S. S. Rodgers, chairman, The Texas Co.; Reese H. Taylor, president, Union Oil Co. of Calif.; and C. H. Wright, chairman, Sunray Oil Corp.

## Products Line Contract Let

Contracts for construction of a 330-mile oil products pipe line from Salt Lake City to Boise, Idaho, have been let by Salt Lake Pipe Line Co., a subsidiary of Standard Oil Co. of Calif. Macco Corp. and Engineers Ltd. Pipe Line Co. will complete the $8 million project by the end of the year. The line will parallel the existing route and boost the company's transportation capacity from 22,000 barrels to 39,500 barrels daily. With the addition of supplementary pump stations it would be possible to raise this capacity to 45,000 barrels a day.

## Schlumberger Appointments

Schlumberger Well Surveying Corp. has announced two new appointments to its staff in the California area. Charles B. Evans has been named manager of a new field office in Newhall, Calif. He has served as field engineer in district offices at Long Beach and Bakersfield and manager at Sacramento. He is succeeded at Sacramento by Stanley E. Coombs, formerly at the Ventura district office.

## Fertilizer Plant

Phillips Chemical Co. will construct a 405-ton triple superphosphate plant at Adams Terminal near Houston. The plant is expected to go into operation late in 1953. Raw materials will be phosphate rock shipped from Florida mines, and sulfuric acid, a part of which will be manufactured from sulfur produced by Phillips Chemical Co. in West Texas.


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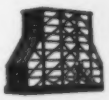

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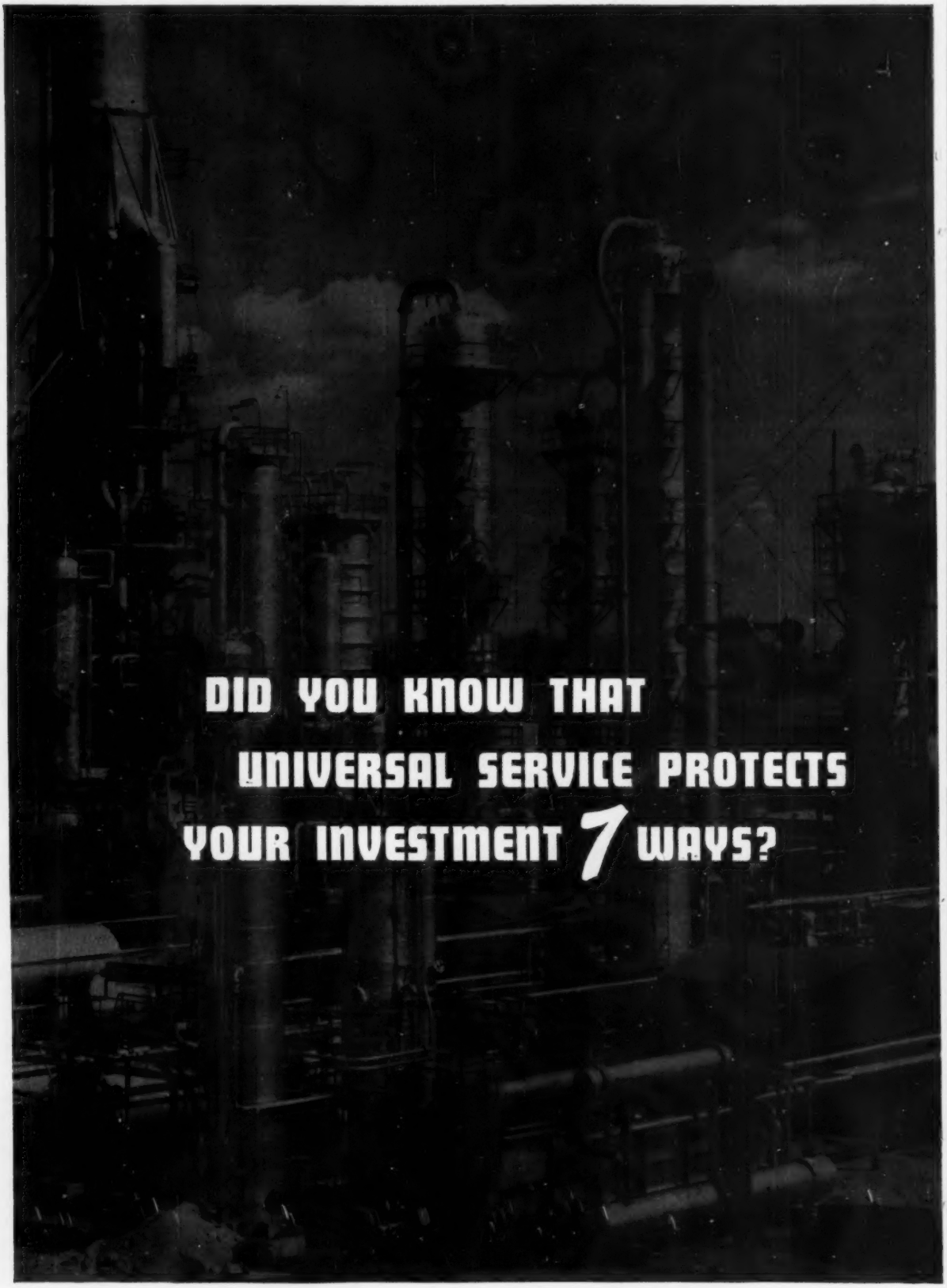
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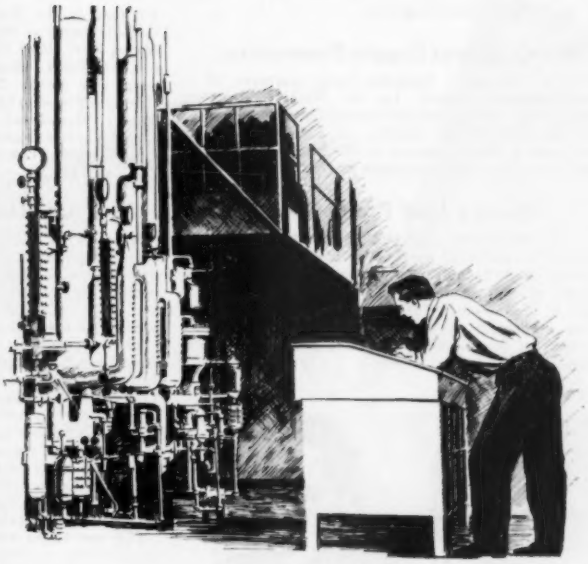

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*Visitors in attendance at the September meeting of Houston chapter of Nomads were, from left to right: Curt Summers, C. M. Summers Co., Caracas, Venezuela; J. J. J. Van Wiechen, B.P.M., The Hague, Netherlands; W. G. Berry, A. Z. Export S.A., Caracas, Venezuela; J. J. Progress, Modern Engineering Co., Houston, Texas; H. R. Powell, Shell Caribbean Petroleum Co., Maracaibo, Venezuela; Clyde Lee, football coach, University of Houston, Houston, Texas; A. R. Gouteyron, Shell Venezuela Oil Concessions, Maracaibo, Venezuela; and Cecil Griggs, assistant football coach, The Rice Institute, Houston, Texas.*

## Engineering Service Brochure

Badger Manufacturing Co., Cambridge, Mass., has published a handsome brochure entitled "Engineering Service" in which is pictured the large staff of engineers who make up the company's personnel. Badger Manufacturing Co. now is set up to make field project studies in economic and process evaluations, and to design and build complete refineries and petrochemical plants.

Walter T. Hall is chairman of Badger, Harold W. Coombs, president, and George C. Hargrove, Elwood I. Clapp, and John V. Minges are vice presidents.

## Sixty Years Old

Black, Sivalls & Bryson, Inc., recently celebrated its sixtieth year of service to the oil industry. The company started as a tank builder in Ohio and now manufactures a full line of processing equipment. It has completed a $2 million expansion during the past year.

## Opens New Office

Schlumberger Well Surveying Corp. has established a location at Haskell, Texas, with D. E. Corley as district manager. Mr. Corley moves to Haskell from Spur, Texas, where he was promoted to district manager in January, 1952. Completing the engineering staff at the new station are J. R. Thompson as junior engineer and B. A. Clifton, trainee engineer.

## Mid-Continent Supply Promotions

R. F. Muensler, formerly store manager of Mid-Continent Supply Co. at Wichita Falls, Texas, has been advanced to machinery manager for the North Texas district. A. L. Murry, who has been a field salesman at Wichita Falls, has been named as store manager at that point.

## Houdry Staff Promotions

C. G. Kirkbride, president of Houdry Process Corp., Philadelphia, recently announced the following staff promotions: Henry D. Noll to director of engineering; A. Wesley Hoge to manager of engineering; Theodore A. Burtiz to supervisor of process engineering; Josef W. Schall to director of development; and John B. Maerker to section chief of development.

*H. D. Noll*

*A. W. Hoge*

*Visitors at the New York Chapter of Nomads' October party at the Stork Club. Left to right: Harry Kerr, Gulf Oil Corp., Tunisia; J. R. Johnson, I.G.E.S.A., Bogota, Colombia; W. O. Woelgesy, The Texas Co., Caracas, Venezuela; Ian Herrera, Trinidad Oilfield Service, Ltd., Trinidad; George Broadbent, General Motors Overseas Corp., Karachi, Pakistan; Frank King, The Texas Co., Caracas, Venezuela; and H. A. McGurty, Standard Oil Co. of California, San Francisco.*

## New Side-Door Choke Assembly

A new type Otis side-door choke assembly has been introduced by Otis Pressure Control, Inc. with an extra-large flow area around the choke landing nipple especially for formation-fracturing and other newly-developed well completion and production operations.

The flow passage of conventional Otis side-door assemblies is through the bore of the choke, which for ordinary two-zone wells is an adequate conduit, but which retards injection of gels and other media under extremely high pressure and in large volume. The new assembly consists of a landing nipple mounted concentrically within an outer flow sleeve. A large by-pass area around the seating nipple provides a flow course of more than two square inches for high-pressure and large-volume flow through the tubing.

The new choke has a built-in equalizing device to facilitate pulling the tool in the event unbalanced or packed-off pressures prohibit full equalization across the choke. Inasmuch as the seating nipple is made up within the flow sleeve, the same size choke can be run in either a 2" or 2½" string.


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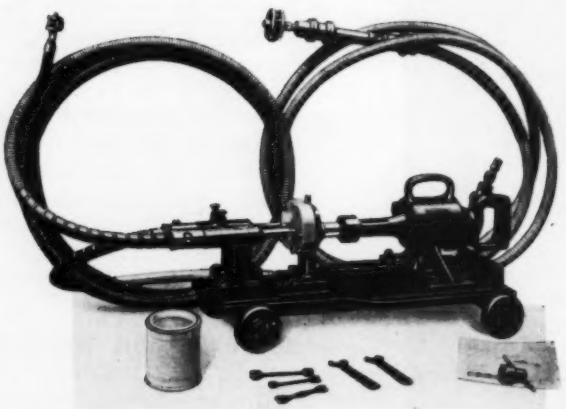
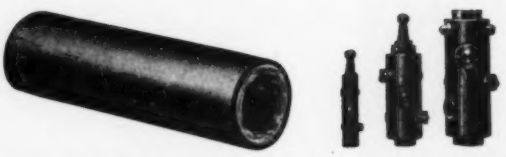
Tubes of 5/8" internal dia. upwards can be thoroughly cleaned by "Skatoskalo" Air Tools.





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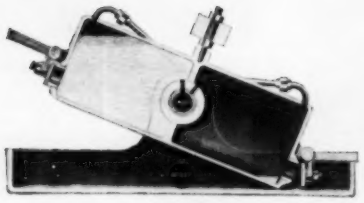

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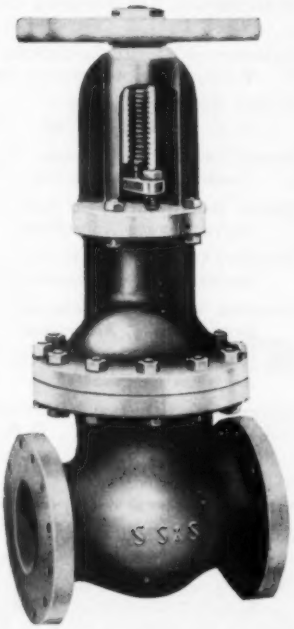

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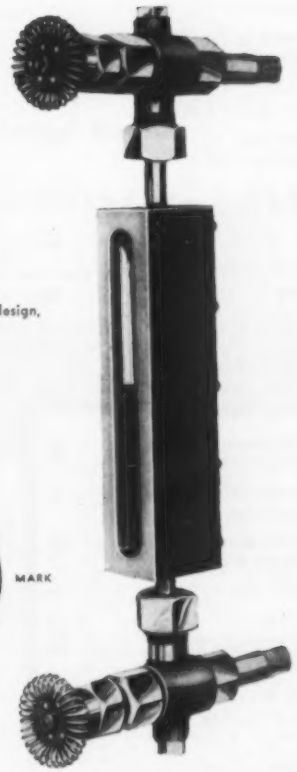

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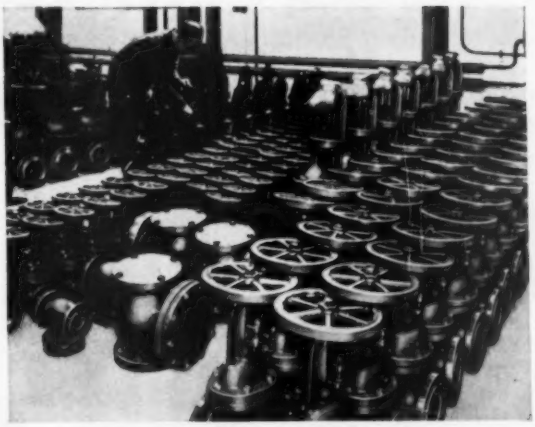

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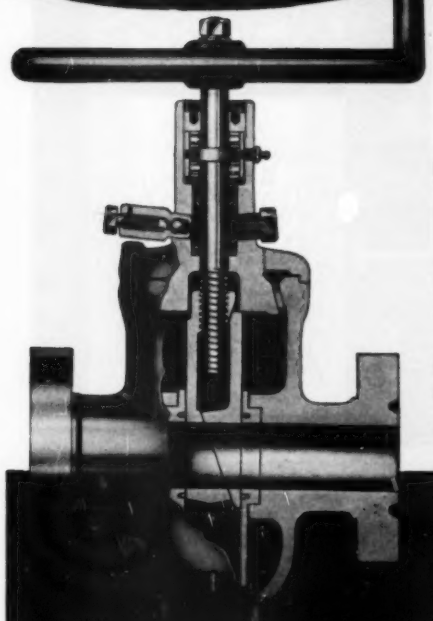

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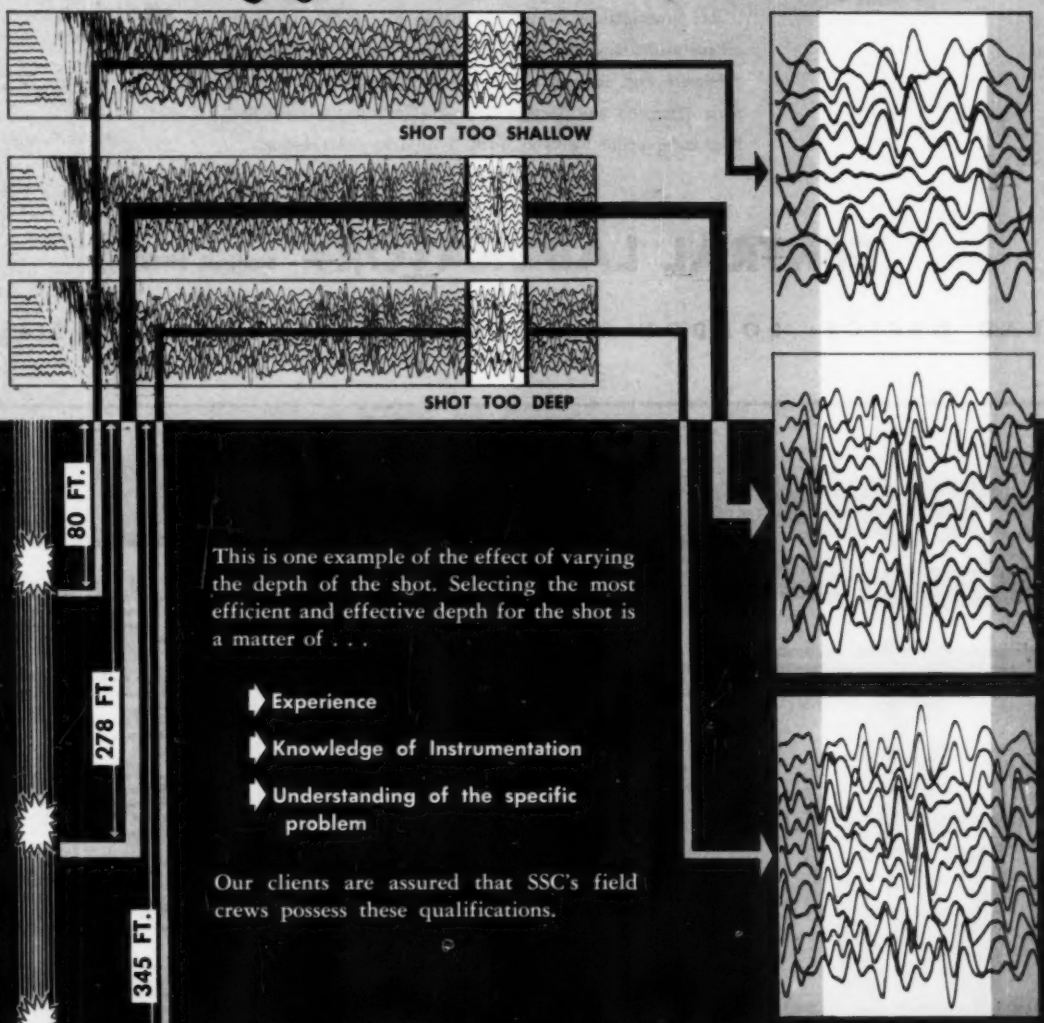
# The Effect ...of DEPTH of SHOT

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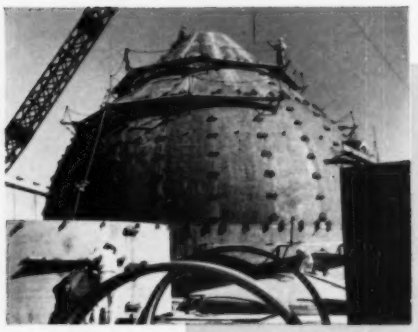
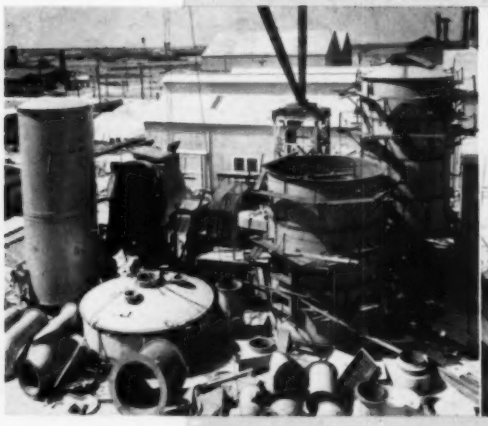
**ENGINEERING CORPORATION**
FAIRVIEW STATION • HOUSTON, TEXAS

# *Sentinels of Fine Fabrication and Dependable Field Erection*



● These WYATT fabricated and erected products are producing better things for better living. A regenerator is being fit-up and matchmarked prior to shipment for field erection . . . A battery of horizontal pressure storage tanks . . . A sulphuric acid plant on which fabrication started in our plant, ended in the field . . . Atmospheric and vacuum towers nearing completion in a refinery . . . Carbon-black storage bin, too large for one-piece shipment, erected on final location.

Wyatt's
HOUSTON-DALLAS-NEW YORK-TULSA



STEEL PLATE FABRICATORS AND ERECTORS SINCE 1913